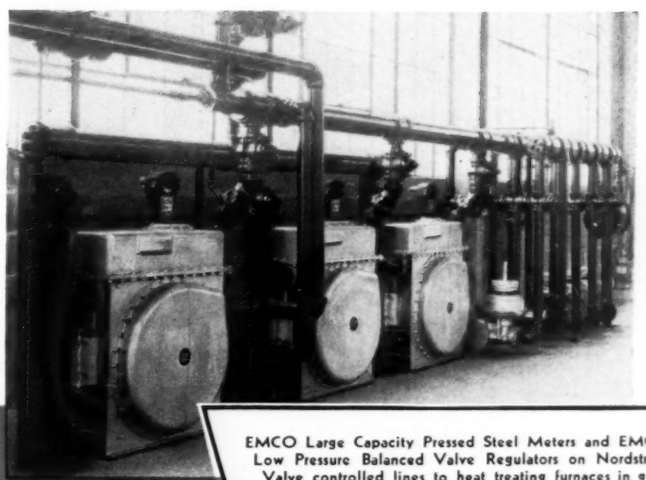
GAS

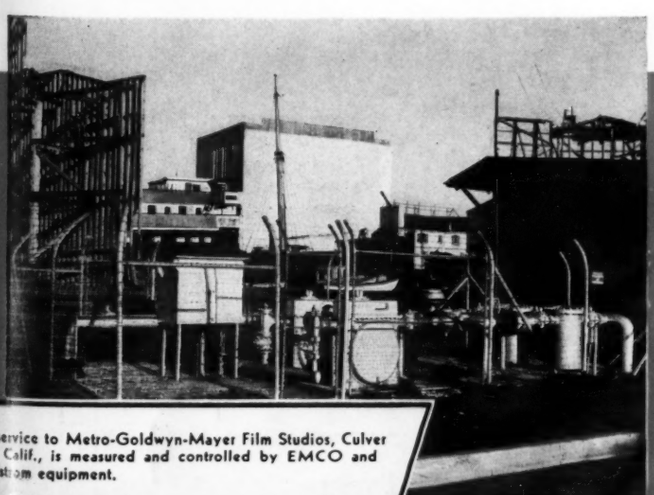
ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT

EMCO METERS and REGULATORS
NORDSTROM Lubricated PLUG VALVES

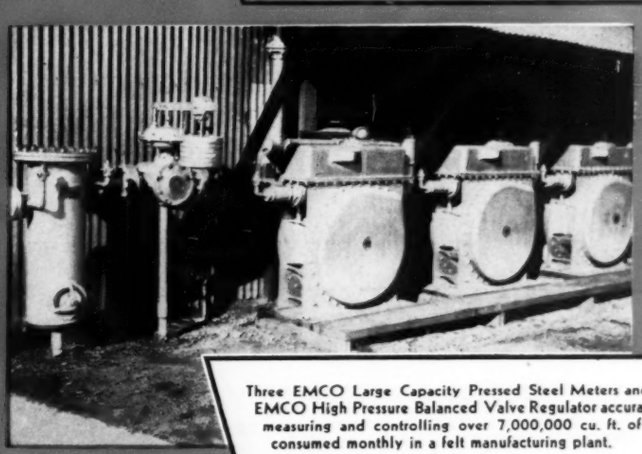
THE PERFECT COMBINATION FOR
Measuring and Controlling
THE INDUSTRIAL GAS LOAD . . .



EMCO Large Capacity Pressed Steel Meters and EMCO Low Pressure Balanced Valve Regulators on Nordstrom Valve controlled lines to heat treating furnaces in glass processing plant.



service to Metro-Goldwyn-Mayer Film Studios, Culver , Calif., is measured and controlled by EMCO and dstrom equipment.



Three EMCO Large Capacity Pressed Steel Meters and an EMCO High Pressure Balanced Valve Regulator accurately measuring and controlling over 7,000,000 cu. ft. of gas consumed monthly in a felt manufacturing plant.

TTSBURGH EQUITABLE METER COMPANY
MERCO NORDSTROM VALVE CO.
BUFFALO · PHILADELPHIA · DES MOINES · CHICAGO · COLUMBIA
CITY · TULSA · LOS ANGELES *Main Offices* - PITTSBURGH, PA. MEMPHIS · OAKLAND · HOUSTON

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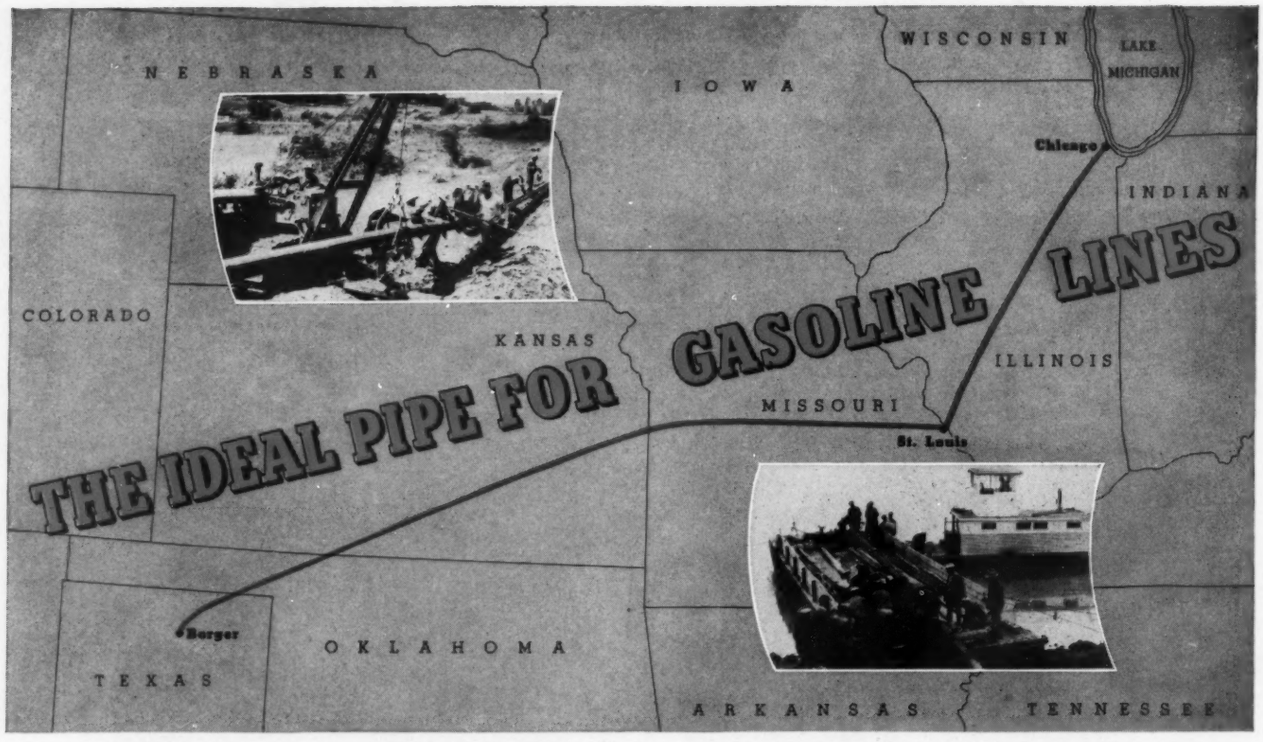


600 Miles of Republic Electric Weld Line Pipe

installed in this gasoline line from Borger, Texas to St. Louis, Missouri in 1930

275 Miles of Republic Electric Weld Line Pipe

used to extend the line to Chicago, Illinois in 1939

The IDEAL Pipe for Gasoline Lines (for these reasons)

1. **Clean Inside**
2. **No Scale (Pickled and Sand-blasted Plates)**
3. **Uniform Wall**
4. **Fifty-Foot Lengths**

REPUBLIC STEEL

REPUBLIC STEEL CORPORATION

General Offices: Cleveland, Ohio

TRUSCON STEEL COMPANY • NILES STEEL PRODUCTS DIVISION • STEEL AND TUBES DIVISION

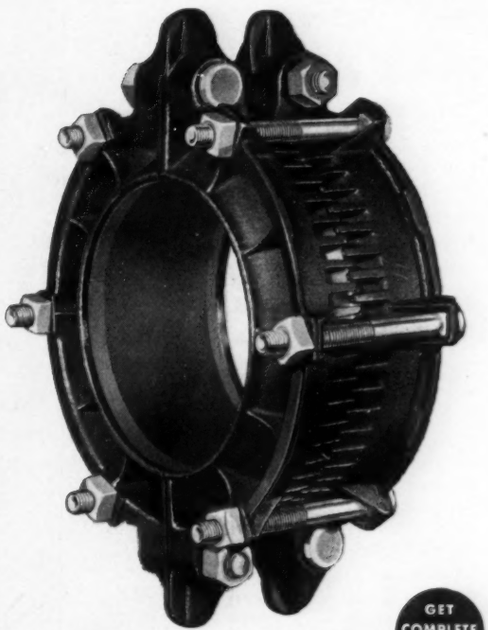
BERGER MANUFACTURING DIVISION • UNION DRAWN STEEL DIVISION

QUICK, PERMANENT REPAIR FOR BROKEN MAINS

SKINNER-SEAL SPLIT COUPLING CLAMPS can be installed easily and without shutdown by ONE MAN in from 12 to 20 minutes—a great time saving when compared with old-fashioned cast iron split sleeves, which usually take two or three men 3 or 4 hours to apply.

This clamp easily passes 600 pound hydraulic test pressure. Made of malleable iron, heavily enamelled; sturdy steel bolts are cadmium plated; soft gum and carbon black gasket is SEALED by Monel metal seal band. Not only splices the broken main but provides a degree of flexibility which prevents future trouble. Thousands used yearly.

Order SKINNER-SEAL Split Coupling Clamps for each size of main—then see for yourself the savings in time and money.



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M. B. SKINNER CO. *Est. 1898* SOUTH BEND, IND.

Advertisers

American Brass Co. 3
American Cast Iron Pipe Co. 62
American Meter Co. 12

H. R. Basford Co. 52
The Blackstone Hotel 64
Blaw-Knox Co. ..
Bundy Tubing Co. 45
Butane-Propane News 54

Carbide and Carbon Chemicals Corp. ..
Cast Iron Pipe Research Association Third Cover
The Chaplin-Fulton Manufacturing Co. 54
Chicago Vitreous Enamel Products Co. 6
The Cleveland Trencher Co. 59
Condensation Engineering Corp. 62
Connelly Iron Sponge & Governor Co. 48
The Cooper-Bessemer Corp. ..
Crane Co. 56
Cribben & Sexton Co. ..

Detroit-Michigan Stove Co. ..
Dresser Manufacturing Co. ..

Ensign Carburetor Co., Ltd. 60

Fisher Governor Co. ..
Fraser Furnace Co. 52

Gasair Corp. 45
General Controls 8, 9
General Gas Light Co. 59
James Graham Manufacturing Co. 43
Greenlee Tool Co. 63

Handbook Butane-Propane Gases, Second Edition 60
Howle Co. ..

Johns-Manville ..
Johnson Gas Appliance Co. 48

Kitson Co. ..

P. M. Lattner Manufacturing Co. 56

Merco Nordstrom Valve Co. ..
Milwaukee Gas Specialty Co. 51
Minneapolis-Honeywell Regulator Co. ..
L. J. Mueller Furnace Co. 48
Mueller Co. 57

The National Supply Co. 7
National Tube Co. 4, 5

Pacific Coast Gas Association, Inc. 53
Pacific Gas & Electric Co. 49
Pacific Gas Radiator Co. 57
Pacific Meter Works 12
Payne Furnace & Supply Co. 58
Philgas Dept., Phillips Petroleum Co. 51
Pittsburg Water Heater Corp. ..
Pittsburgh Equitable Meter Co. Front Cover

Reliance Regulator Corp. 63
Republic Heaters Sales Co. ..
Republic Steel Corp. Second Cover
Reynolds Gas Regulator Co. 61
Robertshaw Thermostat Co. ..
George D. Roper Corp. ..

Semet-Solvay Engineering Corp. 10
Servel, Inc., Electrolux Sales Division ..
Sharples Solvents Corp. ..
M. B. Skinner Co. 1
Spencer Thermostat Co. 50
The Sprague Meter Co. Fourth Cover
Standard Oil Company of California 55

U. S. Pipe & Foundry Co. ..
United States Steel 4, 5

The Vent-A-Hood Co. 58

Ward Heater Co., Ltd. ..
Webster Engineering Co. 47
Welsbach Co. 52
Worthington Pump & Machinery Corp. ..

John Zink Burner Co. 55

GAS

Fifteenth Year of Publication

Contents for December, 1939

GUEST EDITORIAL: A National Perspective . *By Frank H. Adams* 11

Thermally Thinking 13

Load Factors and Increment Costs in Gas Transmission *By Edward L. Fischer* 15

United Gas Augments System with 161-Mile Pipe Line 20

Your Salesman's Pay Check . . . . . *By Stanley Jenks* 21

Lone Star Builds 50-Mile Pipe Line to Bryan, Texas 23

A New Method for Building High Pressure Gas Holders 24

Cooking Schools with a Theme . . . . . *By Zella Patterson* 26

Gas for the Flue and Pipe Heating of Hot Beds . . *By E. A. Bartolina* 28

ABSTRACTS BY THE STAFF:

Use of City and Natural Gas for Metal Cutting . *By Carl Wierum* 29

Plans Formed for Founding of Gas Research Institute *By Frank C. Smith* 31

Southern Counties Develops a Felt Type Dust Filter *By F. H. Winslow* 32

Perhaps Your Customers, Too, Will Rent Hot Water *By Harold Lund* 33

The Installation of a Large Gas-Fired Continuous Vitreous Enameling Furnace . . . . . *By A. F. Michael* 34

Controlled Atmospheres for Heat Treatment of Copper *By Ralph D. Hawkins* 35

Seeing That the New Home Is an All-Gas Home . *By F. M. Banks* 36

Butane-Air Does Standby Service at Colusa, Calif. *By Harry J. Smith and John K. Heller* 42

Champion Spark Plug Co. To Install New Gas-Fired Continuous Decorating Kiln . . . . . *By Harry W. Smith, Jr.* 37

Sales Slants 40

Industry Personalities 50

Current Reading 58

Modern Products 62

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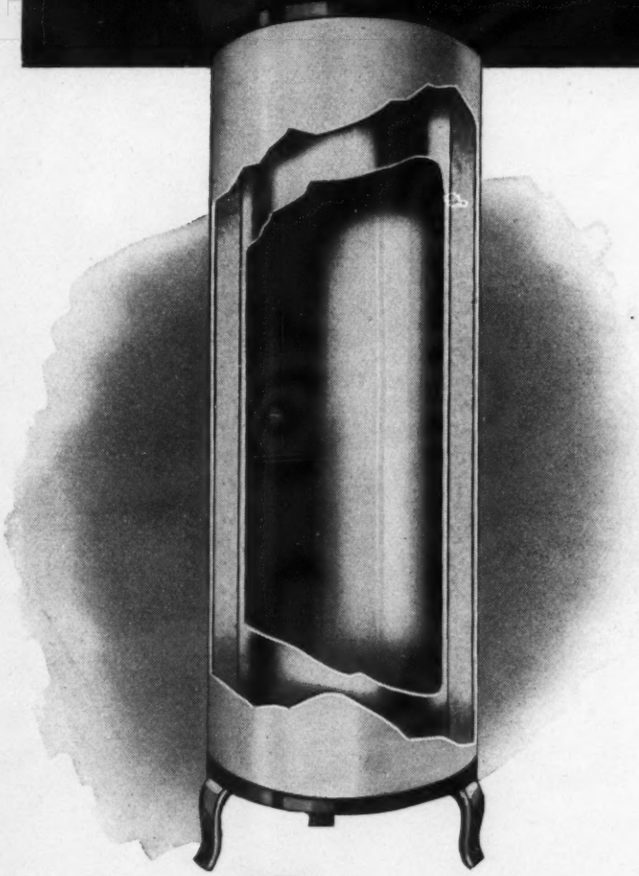
Steadier Gas Consumption

Fewer Service Calls

Happier Customers

..."Yours for keeps" when you promote water heaters with tanks of non-rust Everdur Metal



AUTOMATIC GAS WATER HEATERS equipped with tanks of non-rust Everdur* are money savers for the customer...and profit makers for the utility.

They provide the customer with rust-free hot water...long, dependable service ...and complete freedom from all trouble and expense due to rust.

From your standpoint, rust cannot interfere with the efficient operation of an Everdur-equipped water heater. Gas consumption is uninterrupted. Unprofitable service calls are less frequent. Customers are satisfied... good-will maintained.

Everdur is Anaconda's copper-silicon alloy. Nearly all copper, it combines unusual resistance to corrosion with good welding properties and the tensile strength of mild steel. Over 20 leading makers of automatic gas water heaters are using Everdur for tanks in non-rust models. 3949

Everdur Metal

ANACONDA
from mine to consumer

THE AMERICAN BRASS COMPANY, General Offices: WATERBURY, CONN.

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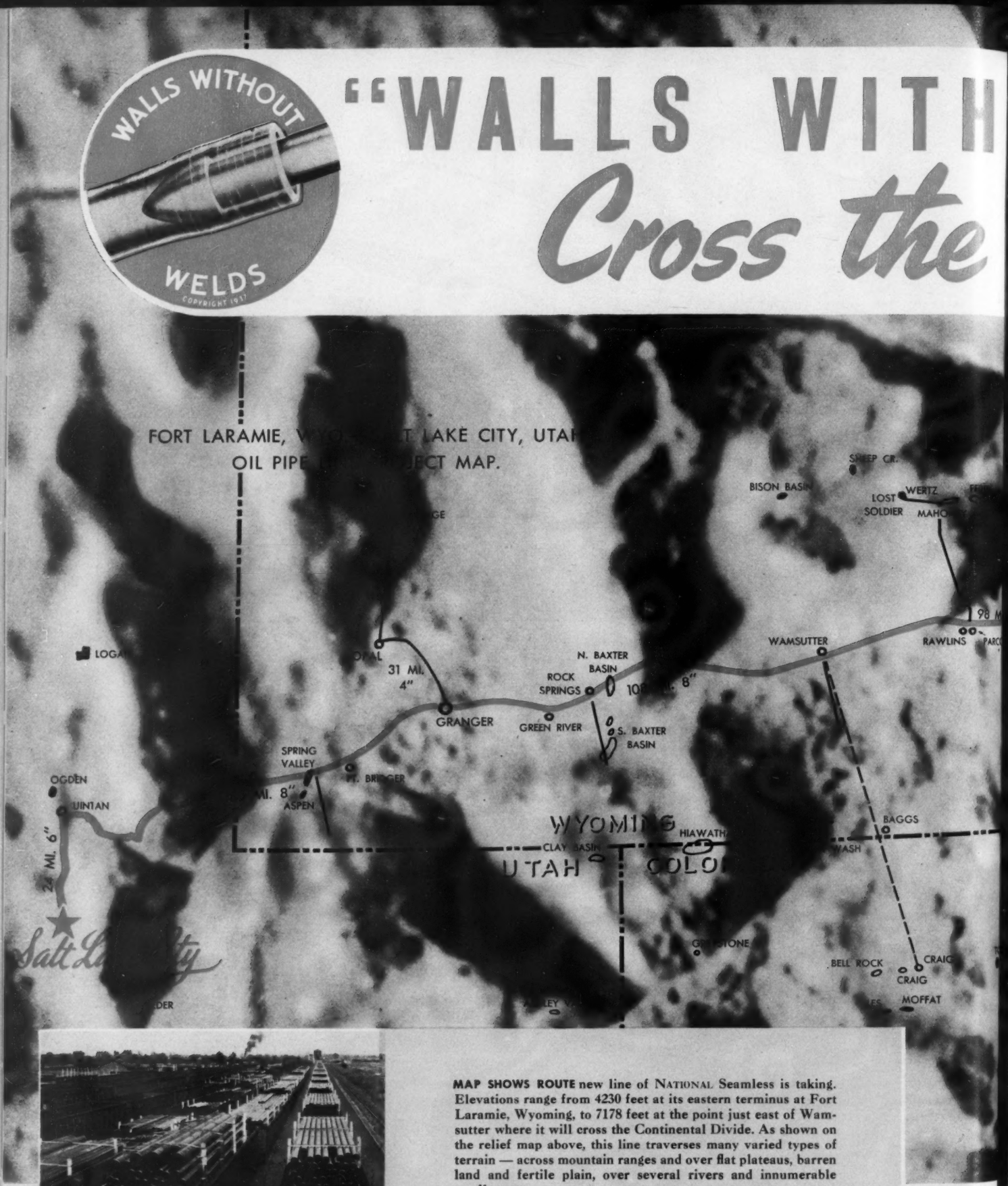
*EVERDUR is a trade-mark of The American Brass Company, registered in the United States Patent Office.

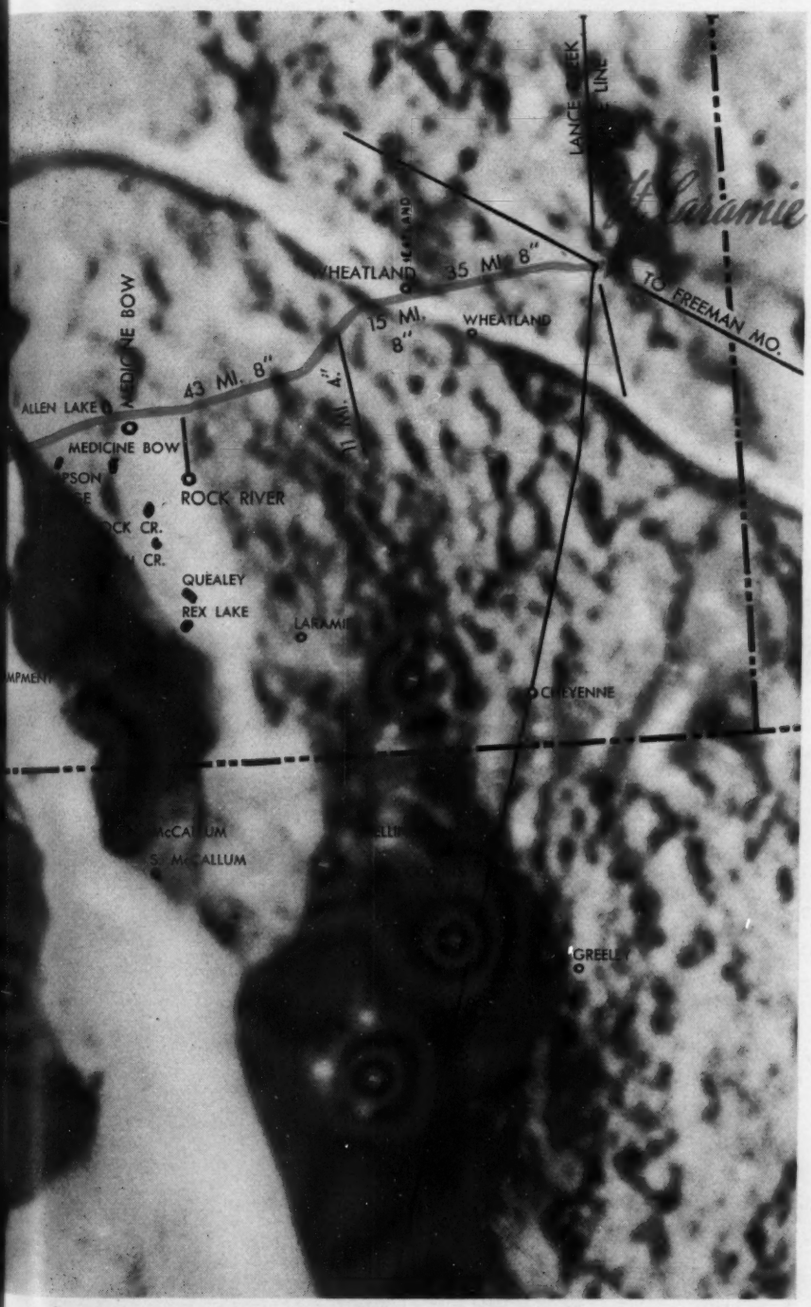


MAP SHOWS ROUTE new line of NATIONAL Seamless is taking. Elevations range from 4230 feet at its eastern terminus at Fort Laramie, Wyoming, to 7178 feet at the point just east of Wamsutter where it will cross the Continental Divide. As shown on the relief map above, this line traverses many varied types of terrain — across mountain ranges and over flat plateaus, barren land and fertile plain, over several rivers and innumerable small streams.

At left—**SOLID TRAIN LOADS OF NATIONAL SEAMLESS READY TO GO TO WORK.** Here is shown part of the many shipments of "Walls Without Welds" used on this vast project.

OUT WELDS"

Continental Divide



Record-Breaking Pipe Line ...Longest Since 1930... 438 Miles of NATIONAL SEAMLESS

America's Preferred Pipe for Gas and Oil Lines

UP over the Rockies, across the Continental Divide, goes this record-breaking pipe line to add new laurels to the already long list of achievements of NATIONAL Seamless.

Destined to carry crude oil to the Salt Lake City Refinery of the Utah Refining Company, this line will be approximately 438 miles long, of which 414 miles will be eight-inch pipe and 24 miles six-inch pipe . . . NATIONAL Seamless Line Pipe every foot of the way. This is the longest pipe line laid in the last nine years. Significant, too, is the fact that this is the first major oil line to be constructed in the Rocky Mountains across the Continental Divide. It will provide an outlet for new fields which may be developed along its route as production from existing fields declines. The line is expected to be completed and in operation by the end of the year.

NATIONAL Seamless was specified for this important line because it is an accepted fact that "Walls Without Welds" provide the extra margin of strength to withstand unpredictable stresses, ground settlements and unexpected pressures. NATIONAL Seamless will move oil economically through this mountainous territory for many years. For it is pierced from solid billets of finest quality steel. It provides full wall strength throughout, uniformly straight lengths, carefully finished ends, ample ductility for easy bending, and clean, smooth surfaces. It is readily handled and joined with minimum time and labor. Its use is your assurance of utmost dependability on every job.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

SPACE HEATER SEASON is *Here!*

★ Space heater sales bloom in snow. The deeper the snow, the colder the temperature, the greater the sales. Make certain the space heaters you sell are all *porcelain* enamel. Porcelain enamel is the *one* finish which is endlessly durable, clean and sanitary, heat, scratch and rust-proof, and everlastingly beautiful. And more and more heater manufacturers are using LUSTERLITE enamels because they know them to be the standard of excellence for porcelain enamel finishes.

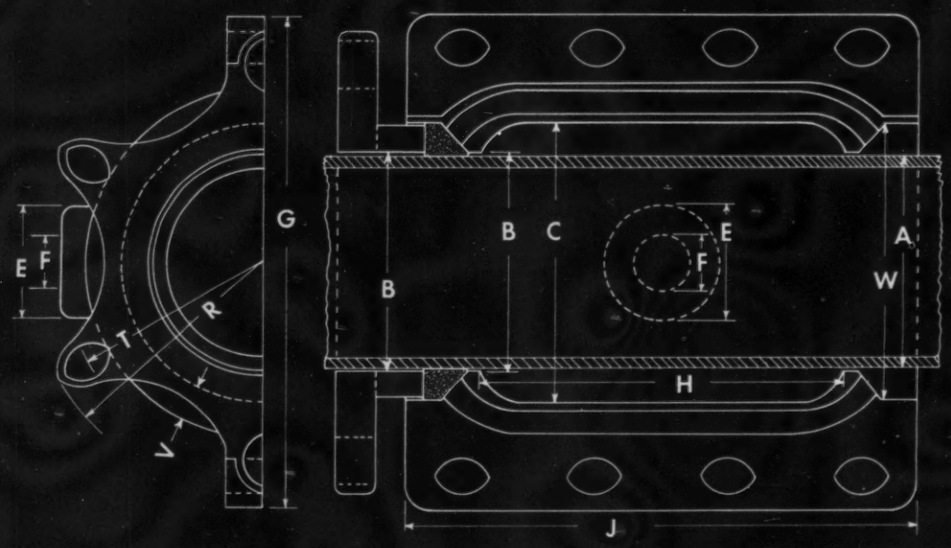
Remember: the more LUSTERLITE on the heater you sell the more profit for you through customer satisfaction. Tell your supplier that you want the ranges and heaters you sell to carry the LUSTERLITE label. It is an added selling point for you—(a powerful one).

LUSTERLITE *Porcelain* ENAMELS

CHICAGO VITREOUS ENAMEL PRODUCT CO., CICERO, ILL.

Dayton No. 8-B SPLIT SLEEVE

Specifically designed for repairing leaks in broken cast iron mains. Constructed entirely of malleable iron.



A	B	C	E	F	G	H	J	R	T	V	W	Boss	No. Sq. In.	Wt.
3.80	3.937	4.687	3	2	10.750	6	9¼	9.125	7.625	.375	5.312	0		
4.80	4.937	5.687	3	2	11.750	6	9¼	10.062	8.500	.375	6.312	0	1350	63
6.90	7.031	7.812	4	2½	13.750	6	9¼	12.312	10.750	.375	8.312	30	1500	71
9.05	9.187	9.812	4½	3	16.000	6	9¼	15.500	13.937	.375	10.562	30	600	98
11.10	11.250	11.750	4½	3	18.062	7	10¼	16.812	15.125	.437	12.625	0	850	128
13.20	13.343	13.843	5½	4	20.343	8	11¼	18.812	17.250	.437	14.718	0		145
17.40	17.562	18.062	5½	4	24.562	10	13¼	23.125	21.437	.437	18.937	18		184

THE NATIONAL SUPPLY COMPANY
DAYTON COUPLING DIVISION
TOLEDO, OHIO

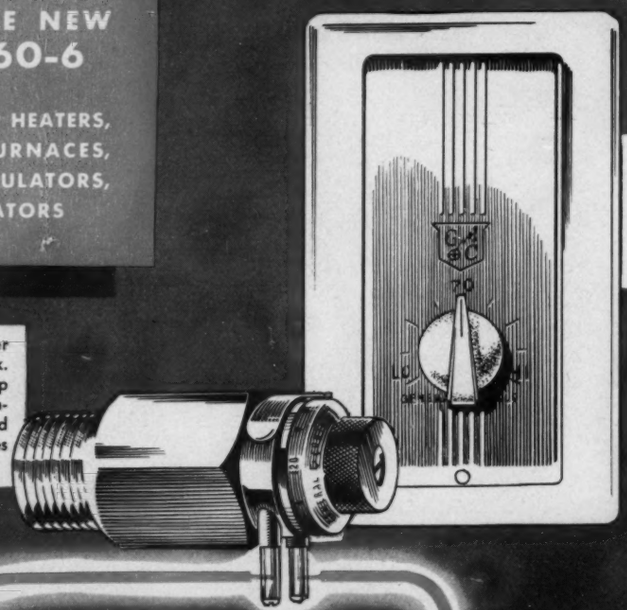
NEVER BEFORE ANYTHING LIKE THIS

a *NEW* ALL-GAS automatic control that opens up a huge new market from people who want automatic gas heat... and now by virtue of this amazing and versatile control can afford to have it today

GENERAL CONTROLS ANNOUNCES THE NEW GENERAL B60-6

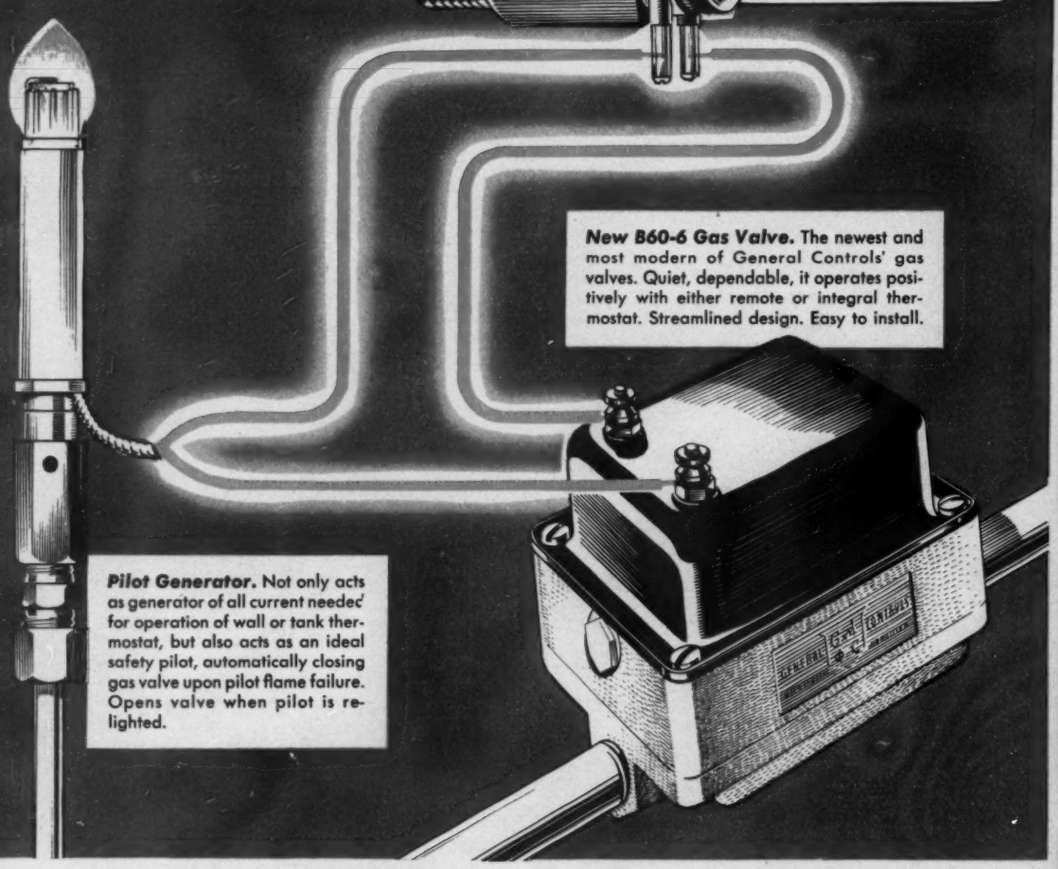
FOR

WALL HEATERS, RANGE HEATERS, RADIANTS, FLOOR FURNACES, WATER HEATERS, CIRCULATORS, GAS STEAM RADIATORS



Remote Wall Thermostat. Sensitive and positive in operation. Handsome and attractive in design. Range: 50° to 90° F.; differential: approximately ½° F. Night cutoff available.

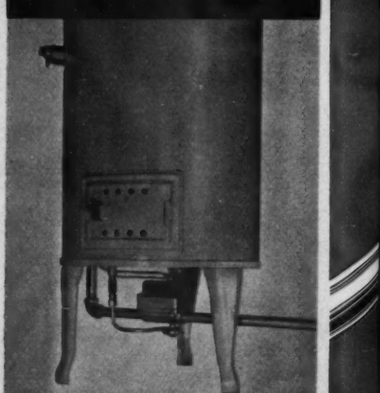
Tank Thermostat. For water heaters. Mounts in side of tank. Permits wiring to be brought up through casing, making a streamlined installation. Compact and sensitive. Setting knob provides easy adjustment.



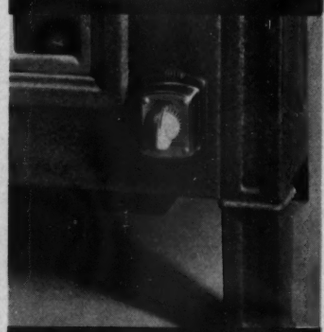
New B60-6 Gas Valve. The newest and most modern of General Controls' gas valves. Quiet, dependable, it operates positively with either remote or integral thermostat. Streamlined design. Easy to install.

Pilot Generator. Not only acts as generator of all current needed for operation of wall or tank thermostat, but also acts as an ideal safety pilot, automatically closing gas valve upon pilot flame failure. Opens valve when pilot is relighted.

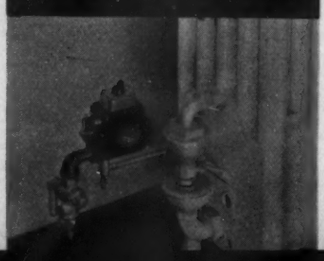
FOR WATER HEATERS
Compact, sensitive tank thermostat mounted in tank side with B60-6 Valve under heater.



FOR SPACE HEATERS
Now, close differential at low cost. With face mounting, integral thermostat (illustrated) or remote thermostat.



FOR GAS-FIRED RADIATORS
Shown with B60-6 Valve and integral thermostat. Available also with remote thermostat.



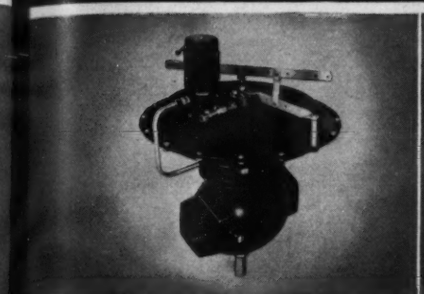
ANOTHER FIRST FOR GENERAL CONTROLS—ANOTHER GAIN FOR GAS

It's all-gas actuated,—no electricity needed. *It's automatic,*—operated by integral or remote thermostat or tank thermostat. *It's inexpensive,*—within the means of most every American family. Costs nothing to operate. *It's easy to install,*—everything furnished in a complete package set. *It's fully tested,*—proved in performance and 100% positive in operation. *It's silent,*—no noises of any kind, starting, stopping, or operating. *It's safe,*—pilot flame failure causes gas valve to close. *It has eye appeal,*—valve and thermostats are attractive, modern streamlined. You, too, will be enthusiastic when you see, inspect and install these amazing, versatile controls. Write today for new bulletin describing the new B60-6 Series Controls Gas Controls.

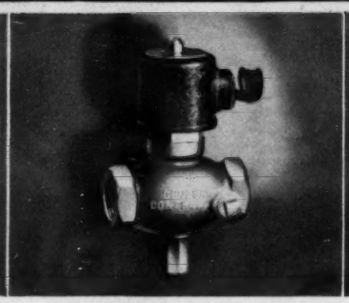
GENERAL CONTROLS
they're just right!

GENERAL CONTROLS ASKS YOU TO DO THIS...BEFORE YOU BUY ANY CONTROL AT ANY PRICE, SEE THESE GENERAL CONTROLS

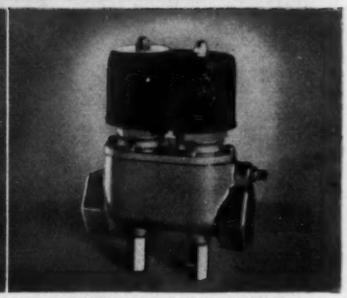
...they're just right!



SLOW-OPENING GAS VALVE. Series B-55. Electrically operated. Widely used industrially. Sizes: ¾" to 6", with or without damper control.



MAGNETIC GAS VALVE. Series K-3B. Magnetic, current failure, 2-wire valve. Controlled thermostatically or by other limiting devices. Low current consumption. Sizes: ¾" to 6"

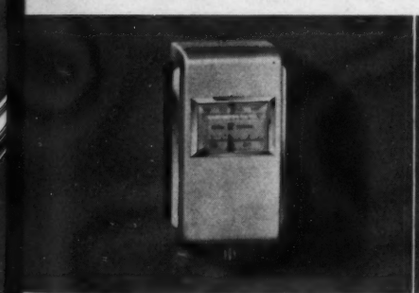


HI-LOW-OFF GAS VALVE. Series D-40. A packless, humless valve, similar to the K-3B, but for high, low, off control. Sizes: ½", ¾" and 1" I.P.S.

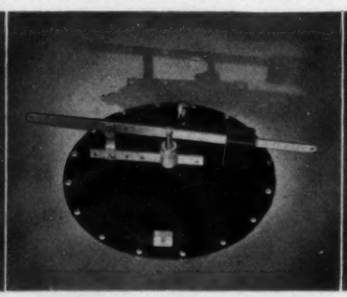
THERMOVALVE. Type MR-2. Pilot flame failure automatically shuts off gas valve. (Thermocouple 100% shut-off manual reset type.)

THERMOPILOT. Type A-100. Pilot flame failure control for electric gas valves. Automatically re-contacts when pilot is relighted.

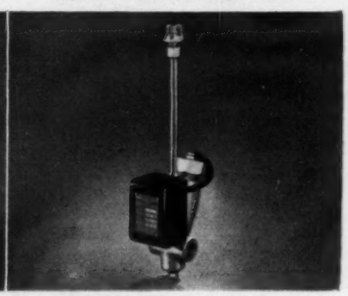
PILOT GENERATOR MODEL. For commercial installations. Corrects difficulties experienced with single type thermocouple where high temperatures, drafts, and high velocities exist.



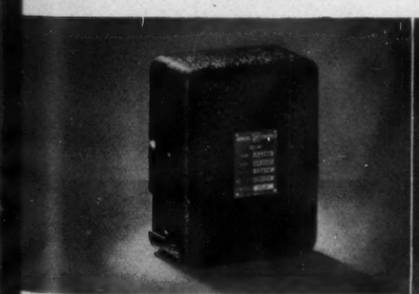
METROTHERM. Series T-70. A beautiful, simple, positive control with bimetal thermostat. Range: 55 to 85° F Differential: only 1½° F



DAMPER CONTROL. Types D-8, D-10, D-12 Designed to operate louvre and damper doors.

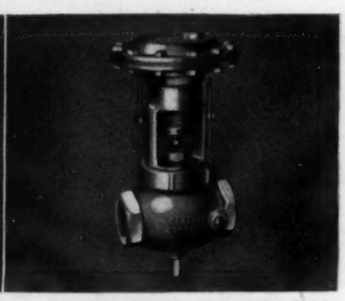


LOW WATER CUTOUT. Type L-2-1. All-electric, positive control for gas-fired boilers. No moving parts in water.



TRANSFORMER RELAYS. Type RS-100. Handles single phase motor loads up to 1 H.P. Heating loads up to 1.1 K.W Other sensitive relays available.

GAS-OPERATED DIAPHRAGM. Type B-100. A simplified gas-operated valve for use with direct or reverse acting controls.



GAS FUEL GOVERNOR. Series V25-1. Single seated, spring loaded valve. Sizes: ¾" to 3" I.P.S. Range: 3 to 300 lbs. boiler pressure. Maximum gas pressure 5 lbs.

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GAS
DECEMBER, 1939

GUEST Editorial

A NATIONAL PERSPECTIVE

By FRANK H. ADAMS
President, Association of Gas Appliance and Equipment Manufacturers

IN discussions between utility representatives and manufacturers, relating particularly to appliances and merchandising, a certain viewpoint develops which is interesting . . . there is a lack of appreciation of the fact that the gas industry is not a national industry in *its operating aspects* in the same sense that the manufacturers strive to look at their appliance distribution on a national basis.

Each utility's operating problems are defined, in many respects, by the boundaries of the territory it serves. But to carry this local viewpoint, which is proper and necessary for local operation, into matters which have national significance is to start with a serious handicap of perspective . . . a handicap which prevents a proper understanding of the problems and which, therefore, limits progress.

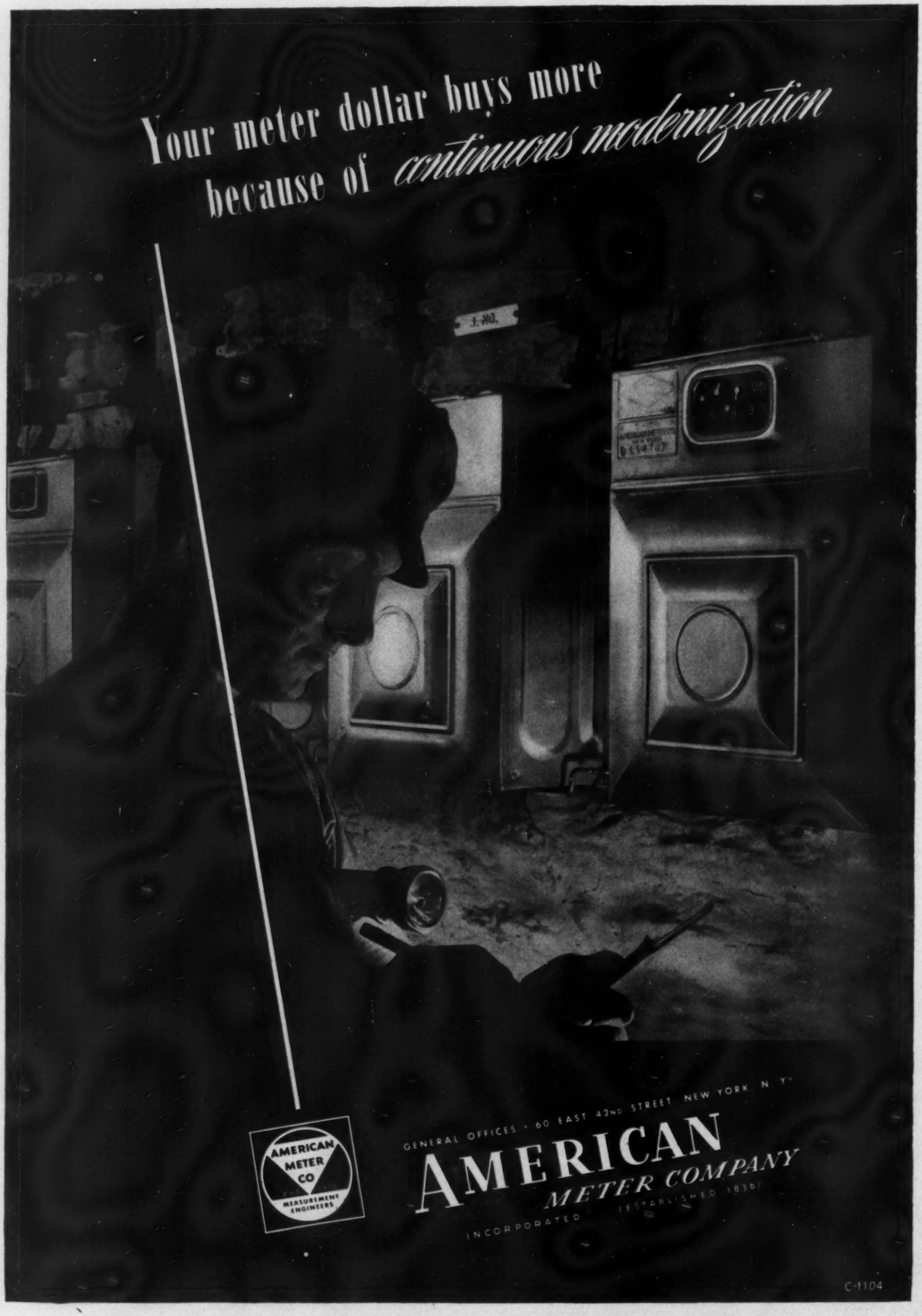
For example, the A. G. A. Laboratory's Seal of Approval has become of value only as the general public has come to interpret it as representing a standard of performance. Whether it is a minimum standard or not . . . whether they understand design details or not . . . that Seal of Approval means something to them. This could not have been accomplished without general support—if one company was selling only approved appliances while another decided that omission of one or two laboratory requirements—and the Seal—was satisfactory to them.

The "CP" trademark has the same significance. It eliminates the danger of placing emphasis on price. The danger of such emphasis is that you invite competition to come in with other values. Electric competition came in with emphasis on quality and being "modern." So a mark which identifies a gas range as being in a quality bracket is an important factor in this merchandising competition, if it can be established in the buying public's mind. Every utility could set up its own requirements, and mark of identification, and find manufacturers to produce the ranges. That, however, would be a feeble effort as compared with what has been and can be accomplished by every utility adding its endorsement and effort to the CP program. Its importance from a national viewpoint transcends local considerations.

The gas industry exhibits at the Golden Gate International Exposition and at the New York World's Fair were more than exhibits of local utilities. They represented a national industry on parade . . . an industry representing $5,000,000,000 of invested capital and 136,000 employes . . . all dedicated to one of the finest of public services to more than 17,000,000 customers. The utility remote from San Francisco or New York may not have had many of its customers attend either Fair. It did, however, have an opportunity to add prestige to the industry and to its own company in the minds of everyone who did attend. Failure to realize this was, again, a lack of national perspective.

In A. G. A. Laboratory requirements we have another problem which requires national as well as local perspective. Requirements cannot be written to meet the problems of every locality. We must also remember, even in our enthusiasm for the perfection of gas appliances, that these appliances must compete in the market with appliances using other fuels. Therefore, we have competitive standards in many types of appliances to consider. In this field, our individual analysis and decision must be balanced by a national perspective.

More careful consideration of the broader national aspect of some of these problems should make for better progress and will, at least, permit an approach to them with better understanding and cooperation.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THERMALLY *Thinking*

Christmas Thoughts

This job of keeping pace with an industry, recording its important happenings, and commenting on its many phases is a strenuous one. And so, when a sentimental season comes along, we perhaps can be pardoned for taking time out to be sentimental too. *G A S* has many friends in the Gas Industry—more than it ever had before—and we appreciate every one of them. For it is our friends and readers who make *GAS* possible. Editorially, we go to great lengths to cater to their industrial tastes, to bring to them the latest developments within and without the industry of consequence to them, and, should we from our unique point of vantage see something or get a seemingly worthwhile idea, we never hesitate to bring it forward. These are our conceptions of our job in serving our industry and reciprocating the loyalty of our friends in it.

During 1939, we have had many opportunities to be grateful for the assistance and support we have received from our utility and manufacturing friends.

As we said before, Christmas is a sentimental season, and, although Santa Claus will be wearing a steel helmet and a gas mask as he makes his rounds in many unhappy countries, we in America are still at peace and, we hope, with good will in our hearts to all men. It is with such a sense ofappreciation in our hearts that we of *GAS* greet our friends in the Gas Industry and wish them one and all a good old-fashioned Merry Christmas and a new year full of the joys of successful accomplishment.

Bullion or Buttons

How about the 1940 edition of the New York World's Fair? And the San Francisco World's Fair too, for that matter, if its management decides to reopen next year? The Gas Industry was represented in both pageants in 1939, and must soon decide whether it is worth the additional investment to continue its space in 1940.

All told, those who cooperated in the Gas Industries Exhibit at the Flushing Meadows show invested close to a million dollars in building, space, displays and operating expense. Of this investment there is about $350,000 in plant and equipment that can be used next year. The question before the house is whether we are to invest another $300,000 to $500,000 in a 1940 exhibit.

This calls for a little realistic thinking; and since this is a family discussion there is no use in kidding ourselves about what the New York World's Fair turned out to be. To some exhibitors it was a whale of a big success, with full showing on at all times and spectators being turned away from daylight to dark. The most notable of these was of course that of General Motors. Its Futurama show drew 5,180,000, and its general exhibit over 13,000,000. The only reason the Futurama didn't draw 13,000,000 or more was that there weren't enough hours in the day and enough days in the six months to take them all through. But General Motors spent in all upwards of $10,500,000 to attract and to handle these millions of visitors. The Railroad show drew 8,000,000, General Electric, 8,000,000, Chrysler, 7,000,000 and Westinghouse, 6,500,000.

Attendance at the Gas Industries exhibit was about 3,000,000. This compares favorably with many of the less pretentious exhibits which drew from four to six per cent of the total fair gate of 26,000,000 people. Three million is a lot of audience, to be sure; but it isn't enough for a $5,000,000,000 industry when two single companies in the electrical industry could pack them in to the tune of 8,000,000 and 6,500,000 respectively.

What is the difference between a good average exhibit, getting from six to ten per cent attendance and a bang-up show pulling in half of the total turnstile count, and still turning them away? The answer is showmanship—showmanship and plenty of good folding money to back it up. Staging an exhibit at a spectacle of the magnitude of the Fair is show business, and nothing else. Those who didn't realize it in 1939—and there were plenty of exhibitors who didn't—are fully aware of the fact as 1940 looks them right straight in the pocketbook.

Stationary exhibits, like the old fashioned advertisements of "Our Plant and Our President" don't fill the bill. And if they do draw a few customers by mistake, they don't hold their undivided attention for long, and they don't send them away with any clear cut conception of the exhibitor's story.

The tempo of the 1940 Fair is being stepped up all along the line. The small and neglected booths

are either revamping their whole conception of how to exhibit, or they are folding up and calling it a day. General Motors has 150 men employed for all winter putting more life and animation into its Futurama. This just gives us some idea of the terrific competition for audience attention that the other exhibitors will face.

But every good show brings attendance to the Fair itself, and that attendance is available to every other good show on the grounds. The question that the Gas Industry must decide, then, is, is it worth while going the whole way and putting on an exhibit that is really representative. And to be representative it must concern itself not so much with the products of the industry, as with the imagination, ingenuity and romance behind its great public service.

There are two alternative courses open. And don't forget that there are plenty of good arguments in favor of each one. They are: Stay out entirely, forget the World's Fair for 1940 on the grounds that the industry doesn't have to go into the carnival game to prove its worth to the American public; or, come back with a real show that for imagination and appeal to public interest will hold its own against all comers.

If the latter proves to coincide with the decision of the Industry, we might as well recognize in advance that it is a job that will take bullion—it can't be done with buttons.

Our Trade Friends

The A.G.A. interim bulletin No. 41, to which we referred so enthusiastically in a previous paragraph, commenting on appliance dealers, says:

> "In addition to the company's own salesmen, the typical gas company is the beneficiary of a substantial amount of independent sales effort—that on the part of the dealers. The dealer is a valuable sales partner, and his interests must be protected to the greatest possible extent by the utility. The relationship between the utility and gas appliance dealers extends beyond mere price agreements, etc."

The extent of our success as an industry in winning the constructive support of our "valuable sales partners" is hard to gage, but we see certain danger signs here and there. For example, one of the plumbers' trade publications this year ran a special electric water heater issue, and its theme was that the plumbing and heating industry, judged by its sales, had been quick to recognize and take advantage of the opportunities presented through favorable electric power rates for water heating (1.2c or less per K.W.H.).

Again, in October this year, *Domestic Engineering* had a special 50th anniversary issue. Only fly in the ointment as we read it was in their "then and now" historical review of the equipment and prices thereof used by master plumbers. Modern water heating showed an automatic storage water heater, but Ye Gods! it was electric.

As a first-class trade publication, *Domestic Engineering* reflects undoubtedly the attitude of the industry it covers. It would be foolish for us to fly off the handle and drag out all the old cussing adjectives again. We have tried that before and it got us nowhere. Why does the plumber feel electric automatic water heating is more modern than gas? Maybe there is some merit to the contention that our sales policies either freeze out the plumber, or are so restrictive that few manufacturers or distributors of standard gas water-heating equipment can meet gas company "wholesaling" competition.

Keeping Going

Sales executives are well aware of one fundamental sales promotional fact. The hardest part of a sales campaign, once it is launched, is to keep enthusiasm from lagging. Men tire, their interest sags, the novelty wears off, and their minds are apt to stray in other directions as they search for the greener grass on the other side of the fence. That is why all of us in some form or another need a "shot in the arm" periodically.

The CP range campaign is a case in point. If ever the gas industry had a winner, it has it now in the CP range. There can be no slackening in the effort to put a CP range in every American kitchen.

Therefore, we welcome the 1940 A.G.A.E.M. appropriation of $110,000, and which is, incidentally, better than four times the initial appropriation for 1937. This, tied in with the $1,500,000 A.G.A. budget for national advertising in 14 consumer and 23 trade publications, looks to us like a formidable background for the two major CP range campaigns scheduled May to June and September to December next year. Evidently there is no "blitzkrieg" about the CP plans.

A Chemical Industry

The chemical strength of the British gas industry is proving of immediate national importance in the present war. It is producing great quantities of toluel, benzole, tar and sulphate of ammonia, vital necessities in modern warfare. Some data is also available on the use of city gas as an automobile fuel. American veterans of the last war well remember the balloon-topped cars and taxis on the London streets.

We are told that 400 cu. ft. of gas (530 B.t.u.) will drive an 8 hp. car (equivalent to American 32 hp.) about 50 miles. With such gas at 72c per thousand, it is estimated that 250 cu. ft. costing 18c, is equivalent to a British gallon of gasoline, which is one-fifth larger than ours. The adjustment from gasoline to gas is very simple.

LOAD FACTORS AND INCREMENT COSTS IN GAS TRANSMISSION

• WITH THE STEADILY increasing network of natural gas transmission pipe lines, extending primarily to large centers of population but in addition serving many smaller communities, it is highly important that careful study be made of rates as related to consumption, so that the maximum use can be made of existing or projected pipe line capacities, and at the same time maximum sales volume can be developed. These problems are considered in a paper entitled "Load Factors and Increment Costs in Transmission and Distribution of Gas," by EDWARD L. FISCHER, gas engineer, The United Light & Power Service Co., Davenport, Iowa, which was presented before the Technical Section of the American Gas Association at the Annual Convention in New York City, October 9-12, 1939. In the portions of this study dealing with the transmission of gas, which are published on these pages, the author brings out some interesting fundamentals and develops a community two-part inducement block rate in terms of a hypothetical but typical pipe line.—(Abstract by GAS.)

WITH the advent of the large, long transmission lines came "load factor" consciousness and pipe line City Gate rates in which the average cost for gas at the City Gate was determined entirely by load factor. This type of rate is generally known as the "two-part rate" and consists of:

1. A daily, monthly or yearly charge of a fixed amount per unit of the maximum 24-hour requirement of the distributor, plus

2. A charge of a fixed amount per unit of gas delivered to the distributor.

The first of these is usually called the capacity or demand charge and the second is called the commodity charge. The theory is that there are certain yearly costs to the pipe line company which are entirely proportional to the total pipe line capacity and length and are therefore entirely independent of the volume of gas transmitted, while there are other yearly costs which vary directly with the volume transmitted and are therefore entirely independent of the capacity.

What is more simple, then, than to divide our charge for gas service into a capacity charge, based on those costs determined by the capacity utilized, and a commodity charge, based on those costs determined by the volume delivered?

A Fair Rate?

Assuming the costs have been accurately determined, it would seem off hand that the resulting rate would be simple, fair and generally acceptable by pipe line and distributors. On closer analysis, however, it proves not so good.

The probabilities are that not a single community will, during the early stages of development, whether it be a community formerly supplied with manufactured gas or one that has previously had no gas service, use the estimated capacity, and if intensive campaigns for the selling of more gas be not carried on by the distributor, the chances are excellent that he may *never* require the estimated capacity. Meantime the pipe line company is getting insufficient revenue to pay its operating expenses and fixed interest obligations. In order to obtain the needed revenue the pipe line company usually sells gas in direct competition with coal or oil in large plants on short time contracts either directly to the user or through some arrangement with the distributor. This arrangement keeps the pipe line company solvent, but before the venture becomes profitable, *the capacity must be sold.*

In these large, long lines, if the capacity charge be added into the cost of gas, even at 100 per cent load factor basis, gas usually could not be sold in direct competition with coal. What load can be added which will increase the required capacity of the distributor and cause him to pay for more capacity? Obviously the answer is "house heating." The distributor, however, looks at the cost of 25 per cent load factor gas and says "No."

The usual result is that some sort of compromise is made to enable the distributor to get his heating gas at a lower price which in effect destroys the two-part rate but does eventually solve the profit problem of both the distributor and pipe line company.

Our two-part rate which started out so bravely as a scentifically correct reflection of the cost of service has now been warped and twisted by necessary supplemental agreements and special cases to meet special loads and conditions, so that it is actually non-operative for a large part of the gas sold.

As an illustration of the effects of the two-part rate on the costs of gas to the distributor, let us assume two communities of equal size buying gas from the same pipe line whose rate is $60.00 per year per M c.f. of maximum daily demand and 10c per M c.f. for gas. Let us assume that their sales of high load factor gas, that is, cooking, water heating, refrigeration, commercial and high class industrial gas, are the same and that the load factor of this type of gas is the same for both communities. Assume City A to sell no house heating gas. Assume its demand to be one million cu. ft. and its load factor 80 per cent. Assume City D to have exactly the same condition so far as this class of gas is concerned but to have in addition a house heating load which by itself creates a demand of three million cu. ft. and the load factor of which is 25 per cent.

The bills for gas for the year for these cities will be as shown in Table No. 1.

Now, can you blame the distributor for saying "No" very emphatically when the pipe line wants him to sell heating gas?

What is wrong? Is it true that we just cannot transport natural gas over long distances and sell it for heating purposes?

Finding the Answer

To get at the answer let us now assume two cities of larger size, each supplied by a separate line from the gas field, each 1000 miles from the field and each having the same relative load as Cities A and B. Let us say that City C has a demand of 50 million cu. ft. with an 80 per cent load factor and City D has a demand of 200 million cu. ft. consisting of 50 million cu ft. of 80 per cent load factor gas and 150 million cu. ft. of 25 per cent load factor gas. Without going into details of pipe line design, let us assume that to supply City C's demand a 16-in. line would be required, and that to supply

City D's demand a 26-in. pipe line would be required. Let us further assume that the lines will each cost $1000 per inch of diameter per mile. These assumptions are approximately correct if we assume the same pressures being used in both cases. For simplicity we will, in this illustration, neglect the costs of compressors. Let us further assume that the fixed costs (those applicable to the capacity charge) are 20 per cent of the investment and that the commodity costs are 10c per M c.f. in both cases. Under these assumptions, the costs at the city gates of each of the two cities would be as shown in Table No. 2.

Thus we find City D's costs, under the assumptions made, actually less per M c.f. than City C's costs, even though City C's load factor is 80 per cent, whereas City D's load factor is only about 39 per cent.

Investigating as to the reason for this, we find that for the 16-in. pipe line the costs per M c.f. of capacity are $72, whereas in the case of the 26-in. line they are $26. It appears, then, that the capacity costs per unit of capacity go downward rapidly as the total capacity utilized increases. This is not surprising when we consider that the costs of a pipe line are roughly in direct proportion to its diameter, whereas its capacity, at a given pressure, increases in proportion to the 8/3rds power of its diameter.

TABLE NO. 1

CITY A

1000 M cu.ft. of demand @ $60.00	=	$ 60,000
(1000×365×.8) 292,000 M cu.ft. @ 10c	=	29,200
Total	=	$ 89,200
Average cost per M cu.ft. $\frac{89,200}{292,000}$	=	.3055

CITY B

4000 M cu.ft. of demand @ $60.00	=	$240,000.00
Gas		
(1000×365×.8) 292,000		
(3000×365×.25) 273,750		
565,750 @ 10c	=	56,575.00
Total		296,575.00
Average cost per M cu.ft. $\frac{296,575}{565,750}$	= $	.5242
Composite load factor 38.75%		

TABLE NO. 2

CITY C

Investment:		
1000 miles of line @ $16,000.00 per mile		$16,000,000.00
Capacity costs—16,000,000×.20	=	3,200,000.00
Gas Purchased:		
50,000×365×.8=14,600,000 M cu.ft.		
Commodity Costs 14,600,000 @ 10c	=	1,460,000.00
Total Cost		$ 4,660,000.00
Average cost per M cu.ft. $\frac{4,660,000}{14,600,000}$	= $	.3192

CITY D

Investment:		
1000 Miles of line @ $26,000 per mile		$26,000,000.00
Capacity Costs $26,000,000×20%	=	5,200,000.00
Gas Purchased:		
50,000×365×.8=14,600,000 M cu.ft.		
150,000×365×.25=13,687,500 M cu.ft.		
28,287,500 M cu.ft.		
Commodity Cost 28,287,500 M cu.ft. @ 10c	=	2,828,750.00
Total Cost		$ 8,028,750.00
Average Cost per M $\frac{8,028,750}{28,287,500}$	= $	.2838

For 50 million capacity our cost is $16,000,000, while for 200 million capacity our cost is $26,000,000. The increment cost of the 150 million capacity, then, is $10,000,000. Under the assumptions made the capacity charge per M c.f. of capacity was $72 per year. The *increment* cost of the additional 150 million capacity is 20 per cent of 10 million dollars, which is $13⅓ per M c.f.

The two-part rate fails to reflect costs accurately, except for the line taken as a whole, for this very reason. If a large line has been built based on the assumption that a portion of the capacity will be required for heating gas, and a two-part rate is made and rigidly adhered to, little or no heating gas will be sold and the line's capacity will not be utilized. At the same time, the high load factor gas that is sold will be at too cheap a rate because the capacity charge has been based on the large line, whereas, had it first been assumed that no heating gas were to be sold, a smaller line with resulting higher costs per unit of capacity would have been built.

Abandon the Two-Part Rate?

Shall we then abandon the two-part rate idea entirely and revert to a block rate or a flat rate? First, let us be a little more accurate in our assumptions and cover a wider range of line sizes.

Our assumption of the cost of a pipe line varying directly with its diameter is not true under all circumstances. Where the same pressures are used for both small and large lines the wall thickness of the smaller line need not be as great as for the larger line and consequently the weight of steel for the smaller line per unit of length is less per inch of diameter than the larger line. The installation costs per unit of length per inch of diameter may be less in the larger line than in the smaller within certain limits. If, however, we assume a uniform wall thickness for all sizes of line, the weight of the pipe, and consequently its cost, will be directly proportional to its diameter. Under this assumption, if we assume the cost of the completed line in proportion to its diameter we may be giving the smaller line a slight advantage but we will not be far wrong. On the other hand, if we utilize the strength of steel in the smaller lines we may increase the pressures used and thus increase its capacity.

In our former assumption we also neglected compressor stations and other accessories. It will not materially affect our result by continuing to neglect the other accessories since they are

TABLE NO. 3

Size O.D. I.D.	Allowable Pressure Pounds per Sq. In. Gauge	Absolute Discharge Pressure at Compressor	Absolute Suction Pressure at Compressor	24-hr. Capacity in M.C.F.	H.P. Required per Station	Cost of Line 75-Mile Length	Cost of Each Compressor Station	Total Cost per 75-Mile Length	Cost of Line 1000 Miles Long	Cost per M.C.F. of Capacity	Yearly Cap. Charge per M.C.F. Using 12% of Investment
4½–3.75	3200	3215	2009	8,568	257	$ 337,500	$ 30,840	$ 368,340	$ 4,911,200	$537.20	$68.78
6⅝–5⅞	2043	2058	1286	18,156	545	496,875	65,400	562,275	7,497,000	412.92	49.55
8⅝–7⅞	1524	1539	962	29,660	890	646,875	106,800	753,675	10,049,000	338.81	40.66
10¾–10	1200	1215	759	44,294	1329	806,250	159,480	965,730	12,876,400	290.70	34.88
12¾–12	1000	1015	634	60,172	1805	956,250	216,600	1,172,850	15,638,000	257.58	30.91
14 –13¼	906	921	576	71,052	2132	1,050,000	255,840	1,305,840	17,411,200	245.05	29.41
16 –15¼	787	802	501	90,066	2702	1,200,000	324,240	1,524,240	20,323,200	225.65	27.08
18 –17¼	696	711	444	110,950	3329	1,350,000	399,480	1,749,480	23,326,400	210.24	25.23
20 –19¼	623	638	399	133,258	3998	1,500,000	479,760	1,979,760	26,396,800	198.09	23.77
22 –21¼	565	580	363	157,608	4728	1,650,000	567,360	2,217,360	29,564,800	187.58	22.51
24 –23¼	516	531	332	183,519	5506	1,800,000	660,720	2,460,720	32,809,600	178.78	21.45
26 –25¼	475	490	306	211,205	6336	1,950,000	760,320	2,710,320	36,137,600	171.10	20.53

not only small but probably do vary approximately with the diameter, but the compressor stations are a large item and must be included in any reasonably accurate setup since they do not vary directly with the line's diameter.

Basis for Table No. 3

To arrive at relative costs and capacities of pipe lines of various sizes, we have prepared Table No. 3, which is based on the following assumptions:

1. That the thickness of pipe wall, for all sizes will be ⅜ in.
2. That the maximum pressure used will be that allowed when stressing the steel to 16,000 lb. per square inch in all sizes.
3. That compressor stations will be spaced 75 miles apart.
4. That the recompression ratio will be 1.6 to 1.
5. That the horsepower requirements will be 30 hp. per million cu. ft. per 24 hours.
6. That the construction costs of the line will be $1000 per inch of outside diameter per mile.
7. That the cost of compressor stations will be $120 per horsepower installed.
8. Capacities are computed by Weymouth's formula for .60 gravity gas and 60° F. flowing temperature.
9. That the capacity charge is 12 per cent of the investment. (This will be discussed later.)

Under the assumptions made, Table No. 3 shows the yearly capacity or demand charge per M c.f. for various sized lines from 4-in. to 26-in., and indicates that these charges do reduce rapidly as the line size increases. This table might readily cause one to immediately think, "Why stop with a 26-in. line?" There is no reason at all except that so far in pipe line practice this is the largest line that has been used.

Before discussing further the abandonment of the two-part rate idea let us inquire into what the proper allocation of costs as between capacity charge and commodity charge is.

TABLE NO. 4. ITEMS OF CAPACITY CHARGE EXPRESSED AS A PERCENTAGE OF INVESTMENT

(1) Amortization (based on 20 year useful life with 3% sinking fund)	3.65%
(2) Taxes and Insurance	2.00
(3) General and Administrative expenses	.75
(4) Pipe Line Maintenance	.75
(5) Bond Interest (and interest on other borrowed Capital) Assume 50% of capital so furnished @ 4½%	2.25
(6) Preferred stock (assume 25% of capital so furnished @ 7%)	1.75
(7) Miscellaneous	.85
Total	12.00%

ITEMS OF COMMODITY CHARGE EXPRESSED IN CENTS PER M CU.FT.

(1) Cost of gas delivered to pipe line (Assumed)	6.00	cents
(2) Compressor station operation and maintenance	.75	
(3) Pipe line operation & expense	1.15	
(4) Profit	5.00	
(5) Miscellaneous	.10	
Total	13.00	cents

My own ideas on this matter are not clear-cut and explicit as to final details, but my mind is clear on two general principles which are as follows:

1. Those costs which are determined, as to amount, entirely or largely by the ability to deliver but are independent of the actual volume delivered during the year should be included in the capacity charge, while all other costs should be included in the commodity charge.

2. The profit to the owners of the line, that is, dividends on common stock, should not be included in the capacity charge but should be in the commodity charge.

This without question allocates to the capacity charge, bond interest, dividends on preferred stock, interest on borrowed capital, amortization (or if you prefer, depreciation) and pipe line maintenance.

In order that there may be something definite to serve as an illustration, Table No. 4, above, was set up.

TABLE NO. 5

Line Size Inches	Demand Per Capita Cubic Feet	Resulting Capacity Charge Per Year Per M Cu.Ft.
4	7.71	$76.42
6	16.34	54.83
8	26.69	45.18
10	39.86	38.76
12	54.15	34.34
14	63.95	32.68
16	81.06	30.09
18	99.86	28.03
20	119.93	26.41
22	141.84	25.01
24	165.17	23.83
26	190.08	22.81

An actual pipe line project, at least a large, long one, would in almost every case not be a single large line from the field to a given community, but a large main line artery with many

TABLE No. 6. RATE DESIGNED TO FIT COST OF SERVICE CONDITIONS FOR HYPOTHETICAL PIPE LINE*

Capacity Charge

First	5	Cu.	ft.	of	Demand	per	Capita	@	9c	per	Yr.	per	Cu.ft.	of Demand
Next	5	"	"	"	"	"	"	@	5c	"	"	"	"	"	"	"
Next	5	"	"	"	"	"	"	@	3.5c	"	"	"	"	"	"	"
Next	10	"	"	"	"	"	"	@	3c	"	"	"	"	"	"	"
Next	10	"	"	"	"	"	"	@	2.5c	"	"	"	"	"	"	"
Next	35	"	"	"	"	"	"	@	2.3c	"	"	"	"	"	"	"
Next	35	"	"	"	"	"	"	@	2.0c	"	"	"	"	"	"	"
Next	35	"	"	"	"	"	"	@	1.75c	"	"	"	"	"	"	"
Excess of	140		"	"	"	"		@	1.6c	"	"	"	"	"	"	"

Commodity Charge

First	10,000	Cu.ft.	per	Capita	per	Year	@	20c	per	M.C.F.
Next	10,000	"	"	"	"	"	@	10c	"	"
Excess of	20,000		"	"	"	"	@	9.5c	"	"

*Provided, however, that the pipe line company shall not be obligated to supply a demand in excess of 190 cu. ft. per capita and provided further that the pipe line company shall not be obligated to supply a demand to any community of more than 10 per cent in excess of the demand paid for during the sixth year of the life of the contract.

smaller branches and laterals. The cost per unit of total capacity would not, therefore, be that of the large, long line, but some figure representing the composite of all the lines. For the sake of simplicity in building up our allocation of costs to the various communities, however, we will assume it as a single line of a given size, 1000 miles long, serving a number of communities aggregating a population of one million people.

What Capacity?

Our first problem in engineering such a line would be to decide what capacity line to build. In all probability we would make a survey of the various communities we expected to supply as to load possibilities. Insofar as maximum load requirements are concerned, we would be primarily concerned with the domestic, commercial and high class industrial gas. We would also canvass the possibilities of large volume industrials in which we would have to compete directly with coal or oil as possible off-peak loads, but the line's capacity would not be based on such loads. We will probably find in most cases the possible load of high class gas will be nearly in proportion to the population. Let us say our survey indicates a maximum day's requirement equal to 190 cu. ft. of gas per capita or a total of 190 million cu. ft. If we design our line in accordance with the conditions assumed in the preparation of Table No. 3 we would choose a 26-in. line which would allow for about 10 per cent increase over the estimate.

From our Table No. 3 we find the demand charge for this line should be $20.53 per Mc.f. if fully loaded. We must, however, to be safe, provide always for some excess capacity for unpredicted demands which for our purpose of illustration, we will say, is 10 per cent. We must, therefore, content ourselves with selling only 90 per cent of our possible capacity, that is, the capacity charge for the 26-in. line must be based on 190 million cu. ft. per day instead of 211 million and our capacity charge per Mc.f. of demand becomes $22.81 instead of $20.53.

Now let us see what demand per capita we could supply for each of the various sized lines from 4-in. to 26-in. and what the resulting capacity charge would be if this size line were built. Calculated on the same basis as above, for the 26-in. line we have Table No. 5.

We have now established a relation between demands per capita and costs of supplying the required capacity based on what such costs would be if each community used and required the same capacity per capita, and the line were built of sufficient capacity to supply those requirements.

Charges for service should, to be equitable and fair to all communities, be based as nearly as possible on costs of supplying that service, and when they are so based we have a condition that will promote sales and give the best returns to both pipe line and distributor and at the same time provide the maximum of service at minimum of cost to the public.

From our illustrations of Cities C and D and more definitely from Table No. 3, we find that the cost of capacity decreases rapidly as the *volume of capacity* supplied increases. From Table No. 5 we find that, having determined the population to be served by a pipe line the cost per unit of capacity decreases rapidly as the demand per capita increases.

Now, if we retain our two-part rate idea, but instead of having a fixed charge per unit of capacity required, we put it in the form of a block with the size and price of each block designed to reflect the costs as disclosed in Table No. 3, we would be coming nearer to a correct reflection of costs. However, it immediately becomes apparent that this would give the larger city a distinctly lower average rate than the smaller community and at the same time would yield the pipe line company a higher capacity charge than necessary, since even the largest city would by itself never reach the lowest block, that is, the block corresponding to the total capacity of all the combined communities. If, however, we base our blocks for each community on the capacity required per capita in accordance with the costs shown in Table No. 5, we have a rate for capacity charge which pretty accurately reflects actual costs of service to each community and offers an inducement for each community to use as much capacity as it can.

The Commodity Charge

Now let us examine the commodity charge and see whether or not it should be a flat rate per Mc.f. or should also be reduced with increased volume.

We previously set out the average costs per M c.f. for various costs incidental to the purchasing or producing of gas in the field and the moving of it from the field to the city gate. Let us examine each of these items as to whether or not they are strictly proportional to the volume of gas purchased and transported.

1. Cost of gas delivered to the beginning of the pipe line: For our purpose let us assume the pipe line company purchases gas at a flat price per Mc.f. This cost then is directly proportional to the volume purchased.

2. Compressor station fuel, lubricating oil and probably maintenance of the equipment, at least maintenance materials, may be said to vary directly in proportion to the volume of gas pumped. Attendance labor, janitor labor and all building maintenance are largely a function of time, and therefore do not vary to any extent with the volume handled. The cost of those items, therefore, expressed in cost per Mc.f. handled would reduce rapidly with increased volume.

3. Pipe line operation and expenses: This item is largely labor and would be practically constant regardless of the volume handled. The cost expressed in cents per M c.f. handled would, therefore, decrease repidly as the volume increased.

4. Profit: This item is not, strictly speaking, an operating cost. It seems reasonable, however, that a larger percentage of the profit should be supplied by the established uses of gas such as cooking, water heating, commercial and small industrial, since the introduction of natural gas will in most cases be instrumental in decreasing the costs per therm.

In general, then, it seems that our costs of securing and transporting gas from the field to the city gates are not a flat cost of a given amount per M c.f. delivered but that the total cost decreases as the volume delivered increases.

In working out our charges for various blocks it is clear that those items of costs which do vary exactly with volume should be included in all blocks and that the bottom block cannot be less than the sum of all such charges.

There are, under our assumptions—

	Cents
Cost of gas delivered to pipe line	6.000
Assume ½ of compressor station operation and maintenance	.375
Pipe line operation	.000
Profit (assume 3c minimum)	3.000
Miscellaneous	.100
Total	9.475

Let us fix the bottom block of our rate, then, at 9½ cents. This leaves 3½ cents additional to be obtained from the higher blocks of the rate. This should, we believe, come largely from the established uses of gas which we would estimate at about 10,000 cu. ft. per capita per year.

A Suggested Rate

We therefore suggest the rate listed as Table No. 6 as about right for our hypothetical pipe line rate to reflect as nearly as possible actual costs of service to various communities served.

The provisos appearing at the bottom of the rate are for the purpose of protecting the pipe line company against possible demands in excess of their capacity and to enable them to sell any unused capacity after a reasonable development period to other communities in cases where some communities may be backward in developing their load.

This is purely a hypothetical rate built up to fit the assumptions made in this article and is for purposes of illustration only.

As a test of this rate's applicability, let us again take our Cities A and B previously used as an illustration and apply this rate to their consumption. To do so we will have to assume some population for them. Let us say it is 35,000 each.

This would make City A's demand per capita 28.57 cu. ft. and City B's demand per capita 114.29. (See Table No. 7.)

From these results one might conclude that since the average cost per M c.f. is so nearly constant that a flat rate of say 35 or 35½ cents might be made. Confining ourselves to domestic, commercial and small industrial gas, this might indeed be a happy solution, but we must remember that City B has about three million cu. ft. of idle capacity for three to four months each year and amounts during all other periods of the year except the extreme peak days, ranging from zero to three million cu. ft. Having paid the capacity charge and most of the higher bracket commodity charge, this gas, if it can be sold, is available at 9½c per M c.f. under our proposed rate, whereas under the flat rate it would cost 35c to 35½c per M c.f. The distributor in City B will undoubtedly find an off-peak market for a large part of it at a substantial gain in net earnings to him, and the pipe line will add 3c per M c.f. to its profit if it is sold. If City B cannot use it, it may be sold elsewhere to the benefit of the pipe line company and still City B is obtaining the gas it can utilize at rates that will allow quantities of house heating gas to be sold.

Increased Cost Offset

Thus we find the increased cost of low load factor gas to be just about offset by the decreased costs of the increment capacity required. At the same time large quantities of low cost gas are made available on an off-peak basis, which gas may very well be considered as a by-product of the sale of gas for heating purposes.

TABLE NO. 7

CITY A's YEARLY BILL

Capacity Charge

5×35,000 =	175,000	Cu.ft. of Demand	@ 9c	= $ 15,750.00
5×35,000 =	175,000	" " " "	@ 5c	= 8,750.00
5×35,000 =	175,000	" " " "	@ 3½c	= 6,125.00
10×35,000 =	350,000	" " " "	@ 3c	= 10,500.00
3.57×35,000 =	125,000	" " " "	@ 2½c	= 3,125.00
28.57 =	1,000,000	" " " "		= $ 44,250.00

Commodity Charge

292,000 (less than 10,000 per Capita)		@ 20c	= 58,400.00
	Total Bill		$102,650.00
	Average Rate per M.C.F. $.3515		

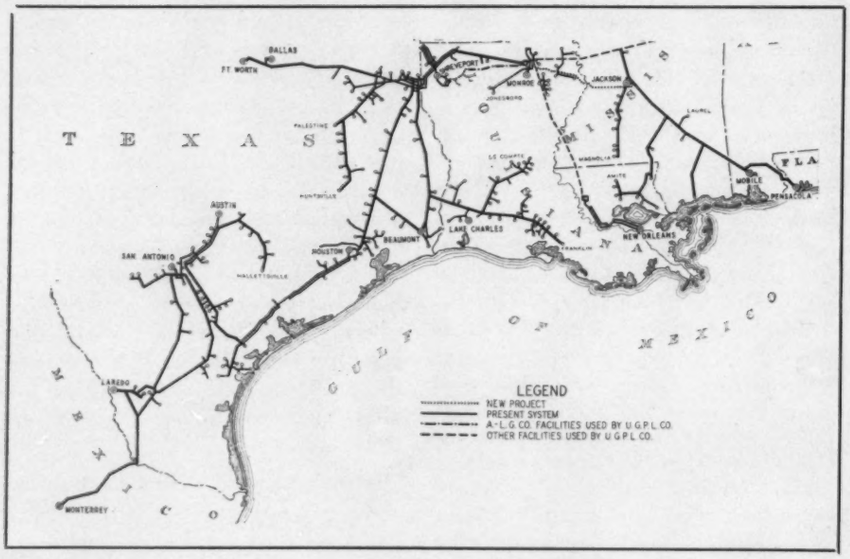
CITY B's YEARLY BILL

Capacity Charge

5×35,000 =	175,000	Cu.ft. of Demand	@ 9c	= $ 15,750.00
5×35,000 =	175,000	" " " "	@ 5c	= 8,750.00
5×35,000 =	175,000	" " " "	@ 3½c	= 6,125.00
10×35,000 =	350,000	" " " "	@ 3c	= 10,500.00
10×35,000 =	350,000	" " " "	@ 2½c	= 8,750.00
35×35,000 =	1,225,000	" " " "	@ 2.3c	= 28,175.00
35×35,000 =	1,225,000	" " " "	@ 2c	= 24,500.00
9.29×35,000 =	325,000	" " " "	@ 1.75c	= 5,687.50
114.29	4,000,000			$108,237.50

Commodity Charge

10 M.C.F.×35,000 =	350,000	@ 20c =	70,000.00
	215,750	@ 10c =	21,575.00
	565,750		91,575.00
	Total Bill		$199,812.50
	Average Cost per M.C.F. $.3532		



AT LEFT

A general map showing the major portions of the pipe line network operated by the United Gas Pipe Line Co. of Houston, Texas. The 161-mile transmission construction project is shown by the dotted line between Monroe, La., and Jackson, Miss.

United Gas Augments System With 161-Mile Pipe Line

UNITED GAS PIPE LINE CO. of Houston, Texas has launched construction of a 161mile, 18-in. gas transmission pipe line between Monroe, Louisiana and Jackson, Mississippi to augment its Mississippi, Alabama, Florida, and Southeastern Louisiana system by making available to the Mississippi district the large reserves of gas available in the western Louisiana territory. The new line will emanate from the Sterling Compressor Station in the Monroe gas field and will connect with the company's main line just below the city of Jackson in Mississippi.

United Gas Pipe Line has made arrangements with the Arkansas-Louisiana Gas Co. for the use of part of its system, and is constructing a 20-in. main line to the Arkansas-Louisiana system just south of Mindon. These facilities will carry the gas from the reserves of the Union Producing Co. in the Sligo field in Bossier Parish and the Lake Bistineau and Sibley fields in Bienville Parish to the east for use in Mississippi, Alabama, Florida, and Southeastern Louisiana.

The line is being constructed in six sections; one section handling the Northwestern Louisiana area, connecting the gas fields to the Arkansas-Louisiana line; one section of 43 miles, commencing at Sterlington station and running east to the town of Waverly, Louisiana; another section starting at Waverly and ending at the Mississippi River; a fourth section starting at the east side of the Mississippi River and working east; a fifth working west from Jackson and a sixth section working on the Mississippi River crossing.

Plans have been made to complete the line within 60 days after the arrival of pipe. Arrangements were made with the National Tube Co., the suppliers of the pipe, to ship at least 45 miles of pipe per week. The line is being protected with Barrett pipe line enamel.

In the construction of a Mississippi River crossing the company has contracted with the Vicksburg Bridge Co. to construct a line on brackets designed by its engineering department in cooperation with the Bridge Co.'s engineers, so that the line will be attached to the north side of the bridge. The 18-in. line at this point will break into two 14-in. lines.

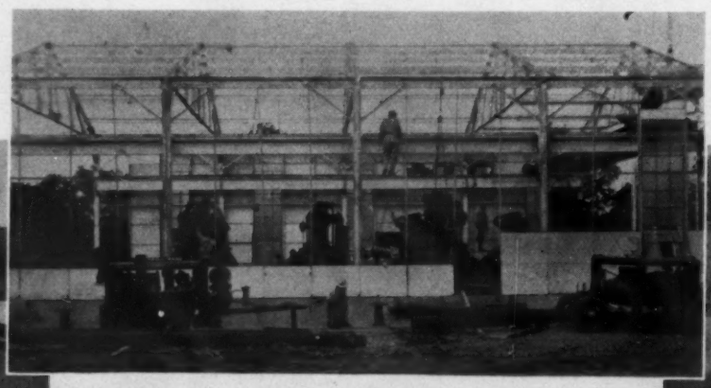
The company has also completed 5 miles of 16-in. line connecting its system in the Monroe field. This line will be used to transport gas from the gathering systems on the west side to the east side and to assist in making deliveries to the Southern Natural Gas Co. at high pressure on the discharge side of its compressor station.

A compressor station has been constructed on the Jackson system, just south of the city of Jackson. This station was started September 4, 1939, and was put in operation October 17. It consists of 12 160-hp. engines, having been dismantled from the Alto compressor station which had been abandoned because of the diminution of the supply of gas in that area.

The design, planning, and the groundwork for the 161-mile line took many months of study on the part of the company operating and engineering departments. Brown & Root, Inc., are the contractors on the project.

With the completion of this system, at an estimated expenditure of $3,000,000, United Gas Pipe Line Co. will have a continuous interconnected pipe line system from Pensacola, Fla., on the east, to Monterrey, Mexico.

Cutting ditch for the Monroe-Jackson 18-in. line. At right can be seen a section of the National Tube Co. Pipe.



The Jackson Compressor Station—a view taken during the construction of the main compressor building which now houses twelve 160-hp. engines.

President N. C. McGowen and George Waverly inspect the Barrett enamel coating as the line is constructed.

Your Salesman's Pay Check

By STANLEY JENKS

STANLEY JENKS

THIS IS THE THIRD and final installment in the series dealing with the problem of paying the utility saleman. The first portion of the article, which appeared in the October issue of GAS, offered an appraisal of the system which measures appliance sales results by the volume of appliances sold per customer and recommended the establishment of "revenue credits per appliance" as the bedrock of a basic sales policy. In the November issue the author described methods of determining salaries and bonuses for supervisors and salesmen based on added revenue quotas to provide satisfactory earning expectancies, contingent on the loads secured from appliance sales. The chapter offered, also, a discussion on dealer coordination. This present and concluding installment includes a discussion of a system of dealer bonuses, an analysis of utility holding practices, and the author's conclusions.—Editor.

IN my time I have been just as ardent a bonus-hander-outer as the next fellow. But in retrospect, I question whether the bonuses were really as effective or meritorious as they seemed at the time. I doubt if few of them were earned, and most of them, I confess, were really expediencies to forestall a hostile dealer reaction, and due primarily to the pressure of a volume merchandising system. Today, I am a bonus heretic, for with this plan they would be totally unnecessary.

Theoretically, a bonus to a dealer is an inducement for him to sell a gas appliance, and incidentally make more money from the sale than he would from its equivalent using another fuel. In practice, it seldom works that way. It usually resolves itself into an extra discount over and above the regular wholesale discount from the gas company, and is therefore discriminatory against those manufacturers whose equipment is not being wholesaled by the gas company. I have more to say about the other manufacturers later. In the plan under review, so long as the equipment is acceptable to the gas company, the dealer is free to buy where he sees fit, direct from the manufacturer or distributor at regularly established trade discounts, which it must be assumed are adeqate to provide him a fair margin of profit. Therefore, any bonus from the gas company is unnecessary. Furthermore, the plan provides for sales help, advertising assistance and home service cooperation, which more than make up any possible bonus inducements.

Accordingly, I do not advocate dealer bonuses as a regular thing, but reserve the right to use them on special occasions where particular emphasis is temporarily needed on this or that appliance.

Wholesaling

Believe it or not, but I feel that the biggest single cause of our dealers' impotence in the gas appliance sales field is our own wholesaling practice. It is completely unnecessary, and definitely restrictive. There are over 75 manufacturers of A.G.A. approved gas ranges and automatic water heaters in the United States, most of them with national distribution organizations. A gas company when it wholesales, to all intents and purposes becomes the sole distributor of quality gas appliances in that field. Whether it intends to or not, due to inventory pressures and a volume measuring stick it dominates the field, and *ipso facto*, it becomes a serious competitor to all those manufacturers' products it does not distribute itself. Some of the practices that I know exist and which make unfair competition are:

1. Consigned stocks to dealers. Manufacturers' and distributors' prices are not designed to cover dealer inventories, and since with many manufacturers, their gas appliances are only a part of their total output, it is asking too much to expect them to jeopardize their general policies to meet a local condition.

2. Quoting prices F.O.B. the point of installation. Setting up boilers and water heaters for a dealer is not a general trade practice and again makes it mighty tough for the outside manufacturer to meet.

3. Longer discounts than the established trade discounts, either directly or in the form of bonuses.

4. Where the gas company turns over its new installation work, using the threat of withholding installations from the dealer to force him to buy at wholesale from the gas company.

Truly, in the light of modern facilities and the wealth of gas products available, wholesaling is completely unnecessary and is furthermore uneconomic. Why carry large inventories and tie up capital needed elsewhere to practice something that is really detrimental to the best interests of the company? In the last analysis, with fuel selling as our real goal, it is unquestionably restrictive when we build a fence around our territory and create conditions within it that make it impossible for more than a few manufacturers and distributors to add their valuable sales promotional efforts to our own. There are some places I know, where, if I were a manufacturer, I wouldn't spend a nickel trying to develop business, other than trying to get the utility business itself, the latter being the neck of the bottle, so positive is the utility control of dealer sales through their high-faluting wholesale policies. Well! Why not go through the neck of the bottle, may well be asked. The answer is the stock one—"Sorry, but we can't handle all the good ones, can we?" And another would-be load-building ally is politely booted out of the window. Mind you, I am not condemning wholesaling so much as the antiquated merchandising system that makes it inevitable. The one begets the other, and to do the proper thing and quit wholesaling, we must perforce change the system itself.

His Biggest Stimulant

There is a good and sufficient psychological reason why we should discontinue carrying either dealer or distributor inventories. The biggest stimulant a dealer has to sell anything other than the profit, is the need "to turn his money." Every merchandiser knows the supreme importance of stock turnover in the economics of merchandising. Accordingly, it is good business to insist on a dealer having an investment in his stock of gas appliances. But when we blithely consign gas ranges, storage water heaters and what have you to a dealer, he has no

inventory pressure on him. In fact, it can have a reverse effect. I actually saw a department store handling several makes of gas ranges, with one line consigned from the gas company, using the consigned line as an invidious comparison to sell those lines in which it had its own money invested. It should almost be axiomatic that a dealer who cannot afford to carry his own stock cannot afford to be a dealer. If he can, then we are suckers for doing it for him. The only other alternative is that we have to go to such extreme measures because our fuel is unsalable—heaven forbid!

Both consigning and wholesaling by utilities are abnormal trade practices. They upset regular trade relations between the manufacturer and his dealer. They are, in the last analysis, more harmful than the disease they are intended to cure. They are unsound by-products of an unsound system of load-building under modern marketing conditions.

A trade-in allowance is a legitimate factor in modern merchandising. The A.G.A. statement of merchandising principles fully recognized its value as an aid to appliance sales. But because our ultimate profit lies in the gas and not in the appliances to be sold, we students of utility merchandising have seen some fantastic offers made, and though on the surface, they are charged to merchandising, we know that they really end up in new business where the allowance is so obviously not in the merchandising wood. No dealer, operating independently, could ever begin to meet such allowances. I plead guilty to some "honeys" myself in my time, but—why be specific? We all know to what lengths we have gone.

Trade-In Allowances

The A.G.A. statement of merchandising principles indicates how trade-in allowances should be handled. The sales compensation plan we are discussing makes this method simple. The trade-in allowance is mutually agreed upon by the gas company and its co-operating dealers, and the dealer bears the full expense. None of that business of the gas company standing half or part of the allowance made by the dealer. By mutual agreement a maximum trade-in allowance has been established and it is up to the gas company and the dealers to conduct their sales within this limit. If the gas company, as many are, is anxious to acquire obsolete trade-in equipment to junk it and get it permanently off their lines, it can and should negotiate separately with the dealers, but the transaction and its accounting should be entirely outside the sales department. It is neither a merchandising nor a new business deal. Another point of control is the financing of dealer term payment paper, assigned to the company. Contracts not in accord with standard practice can be rejected. Rather than dwell unduly on possible complications which at the most are minor, it would be necessary to be specific at the outset with our dealers, and supplement our own arrangements by enlisting the support of their distributors and manufacturers.

Conclusion

The plan that has been outlined is designed primarily to broaden our gas sales effort by removing the political and economic hazards that jeopardize our right to sell appliances and thereby retain control of our own development.

By paying our sales supervisors and salesmen in terms of total load added through the sale of appliances, the door is opened to effective dealer co-operation without fear or favor. Every dealer in approved gas equipment has an equal opportunity in the field without any competition from the very people—the gas company—who can profit most from his success. And there is no discrimination against any worthy manufacturer, able and willing to do a job in our territory.

It has been shown that such a plan is economical to operate expressed in terms of the ratio of new business expense to added revenue. It is flexible so that management can write its own ticket on how much it wants to spend to get the business, and for the first time perhaps, management can evaluate its merchandise sales department solely as a load-building agency without having to resort to a misleading measuring stick such as the volume of appliance sales per meter, which in the last analysis, can be made to mean anything.

The need for subsidizing bonuses, and the restrictions of wholesaling are removed.

The willing dealer is made an active and independent ally of the gas company. He runs his own business, sacrifices none of his corporate identity and in the field, he knows, so long as he sells approved gas appliances, he need have no apprehension about gas company competition.

The plan is geared to modern needs, for it presents a practical way to obtain maximum promotional effort by recognizing that the whole is greater than the part in encouraging all who can contribute sales promotional effort to do so.

In a nutshell, this plan makes possible an open market with the gas company helping *all* who can help the gas company, itself content to allow manufacturers and their dealers a profitable opportunity in its territory, without the gas company losing control of the situation, and reaping the rewards of a better and more widely promoted gas fuel service.

CALENDAR

December

National Industrial Council — Waldorf Astoria Hotel, New York, N. Y.

January, 1940

Louisiana Engineering Society — Fifth Annual Meeting, St. Charles Hotel, New Orleans, La., January 12-13.

February

Southern Gas Association—Annual convention, Hot Springs, Ark., February 12-14.

April

Missouri Association of Public Utilities—Annual Convention, Elms Hotel, Excelsior Springs, Mo., April 17-19.

Southwestern Gas Measurement Short Course—College of Engineering, University of Oklahoma, Norman, Okla., April 16-18.

May

Natural Gas Section, A. G. A.—Annual convention, Dallas, Texas.

Gas Exhibit Is Feature At Portland Livestock Show

A total of 118,187 persons visited the Pacific International Livestock Exposition, held in Portland, Ore., October 7 to 14, where Portland Gas & Coke Co.'s illuminated modern gas appliance booth was one of the largest, most colorful and interesting of the 92 industrial exhibits displayed.

Featuring appliances for the "four big jobs," the exhibit presented a five-paneled background, blue flames and attractive lettering, set off by indirect lighting. It was arranged by Robert B. Elliott, sales promotion manager, Kenneth G. Martin, plumber-dealer coordinator, and Ralph H. Jaenicke, display manager.

The CP ranges shown attracted much attention, according to company observers.

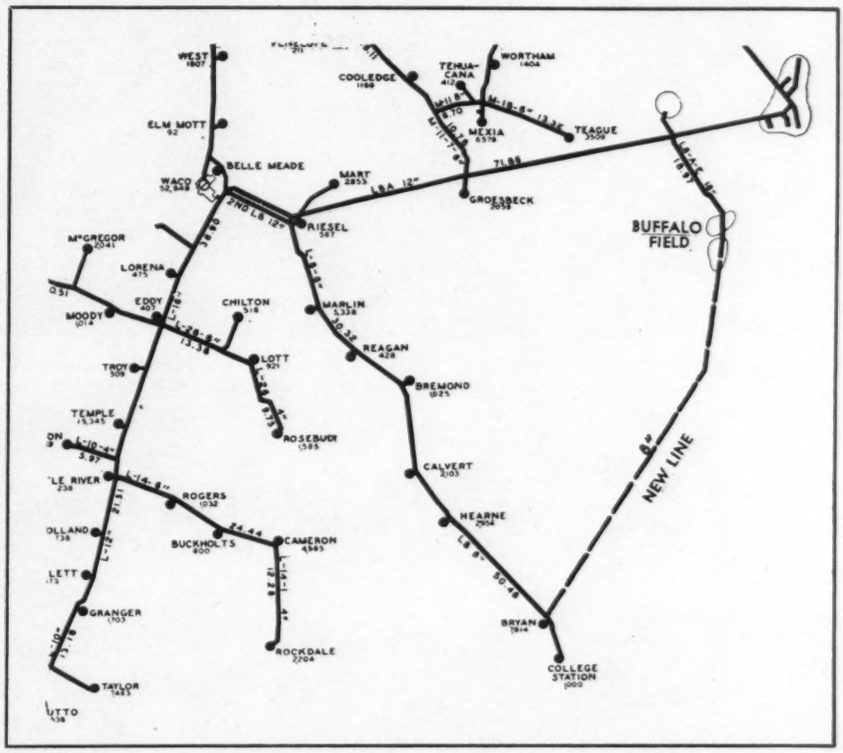
Two Companies Apply to RFC for Pipe Line Funds

The Kansas Pipe Line & Gas Co. and the North Dakota Consumers Gas Co. are awaiting the results of their applications to the Reconstruction Finance Corp. for funds to use in the construction of proposed pipe lines that would pass through communities in eastern North Dakota and western Minnesota and ultimately reach the Mesaba iron range of northern Minnesota.

Until such sufficient funds become available to guarantee adequate service and distribution of gas enroute, the Federal Power Commission is delaying final action upon their applications, according to a ruling of October 25.

AT RIGHT:

Map showing the course of the 50-mile, 8-in. welded steel pipe line now under construction between Bryan, Texas, and the company's Buffalo field line. Course of the new carrier is indicated by the broken line.



Lone Star Builds 50-Mile Pipe Line to Bryan, Texas

THE map on this page shows the course of the new 50-mile 8-in. steel welded gas transmission line now being constructed by the Lone Star Gas Co., Dallas, Texas. The company's first major pipe line construction project since 1937, the new line is scheduled for completion soon after the first of the year, and will augment supply to the company's main line serving College Station and Bryan and form a loop system which will insure continuous and uninterrupted service to towns between Waco and College Station.

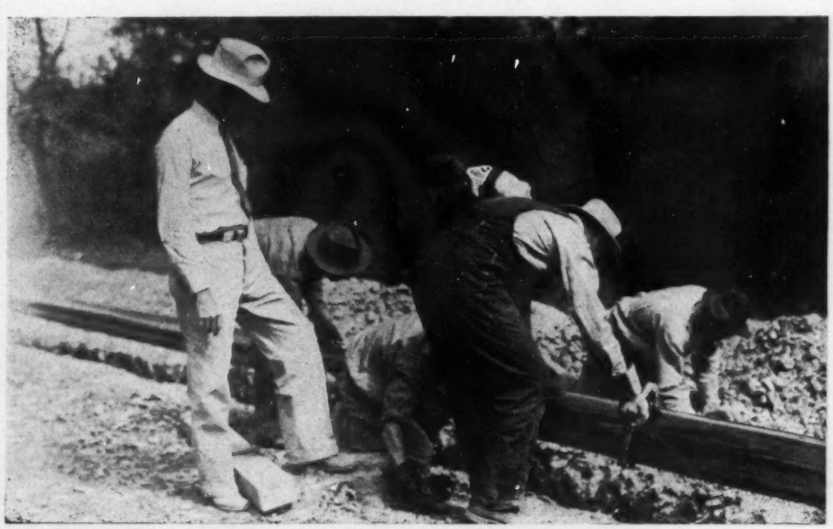
The new line will run in a northeasterly direction from Bryan, connecting with the company's Buffalo field line just south of the town of Buffalo. The Buffalo field line connects with the company's L8-A—12-in. line between the Long Lake and Cayuga gas fields and Riesel. When the line is completed, gas may be supplied to any point on the loop from more than one direction from most of the company's principal gas reserves.

Construction on the new line began early in October when a crew under the supervision of Aubrey Boyd, pipe line foreman from Cayuga, completed a section of the 8-in. line over the Navasota River bottom near Edge. Six dry wash and two river crossings were laid in the bottoms which are heavily wooded and matted with small underbrush. The work was completed early in order to avoid winter rains. Upon completion of the crossing, the Boyd crew started work near Buffalo laying the line southeast toward Bryan. Another crew, headed by Eldon Glenn, Waco pipe line district foreman, started from Bryan working northeast toward Buffalo.

The line is of all welded construction, the welding contractor being H. C. Price of Bartlesville, Okla. Barrett Hot Coat and Johns-Manville asbestos felt protect the line.

Along the course of the line the towns of Centerville and Leona have already furnished a sufficient number of gas users contracts to enable the Community Natural Gas Company to extend its distribution service, and engineers from that company have started preliminary action to pipe the two towns. It is expected that other small communities will also subscribe.

The line will enable the Lone Star company to fulfill the increasing demand for its service in the towns of Bryan and College Center, which have added many meters in the past few years. The line's largest user is Texas A. & M. College at College Station.



Aubrey Boyd, Cayuga pipe line district foreman for the Lone Star Gas Co. in charge of the north construction crew on the company's new 50-mile pipe line project, inspects the "holiday" detector operations on the Navasota River bottom crossing.

Former Laclede Head Dies

Edward P. Gosling, former president of Laclede Gas Light Co., St. Louis, Mo., died of a heart disease October 27. He was 64 years old, and had been president of the company from 1932 to 1936. Born in Worcester, Mass., Mr. Gosling had been in the public utility industry for 45 years.

(1) The foundations are laid: Foundations for five of the eight holders are seen in the panoramic view of the holders' site. The smaller blocks will support the rollers on which the steel shells will rest during construction. Permanent foundations, four for each holder, are at either end.

A New Method for Building High

THE series of photographs appearing on these pages tells the story of a high pressure gas holder construction job in the Santa Monica Bay district of Southern Counties Gas Co., of Los Angeles, which is exciting great interest among engineers in Southern California, and which no doubt will be studied by steel pressure vessel construction engineers all over the country.

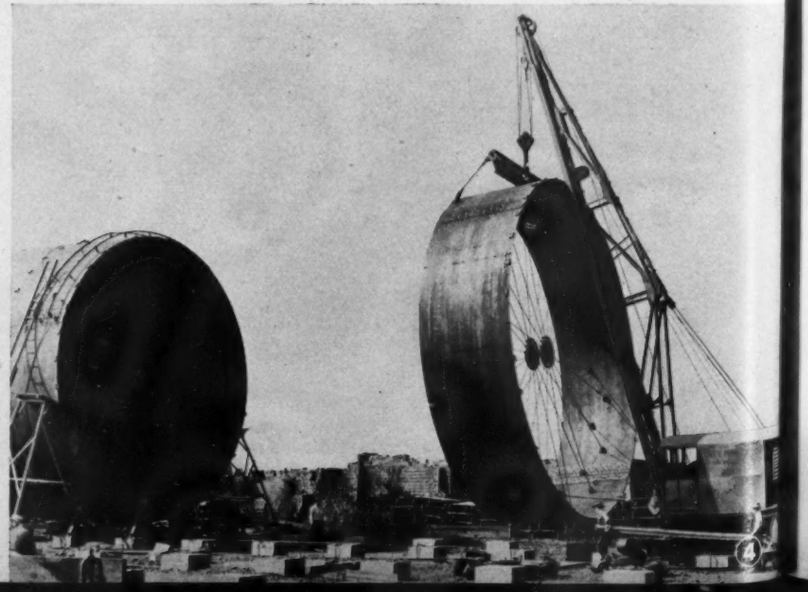
Engineers will recognize the points of departure from past practices in the erection of this type of structure. But for the benefit of lay readers it should be explained that here for the first time on a field-erected job of this magnitude each of the steel cylinders is assembled on rollers and the entire vessel rolled to permit welding the round-about seams in down hand position. This effects considerable saving in welding costs and practically eliminates the necessity of any scaffolding.

The method, which is much the same as that employed on smaller jobs in welding shops, is a development of W. A. Sandberg, engineer for the Lacy Manufacturing Co., which is doing the

(2) Longitudinal seams are riveted: The first field operation consists of riveting four prefabricated steel plates together on a horizontal platform, to form a section of the shell 32 ft. in diameter and 8 ft. long.

(3) The ring is lifted: Raised from its horizontal position, the great bicycle wheel-like ring is suspended above the parallel rows of foundation blocks. At right, ready to be put in place to support the ring, may be seen the adjustable rollers upon which the shell will be revolved during welding.

(4) The shell takes shape: One after another successive rings are set on a pair of rollers and aligned with the cylinder. The rollers are supported by hydraulic jacks to provide adjustment.

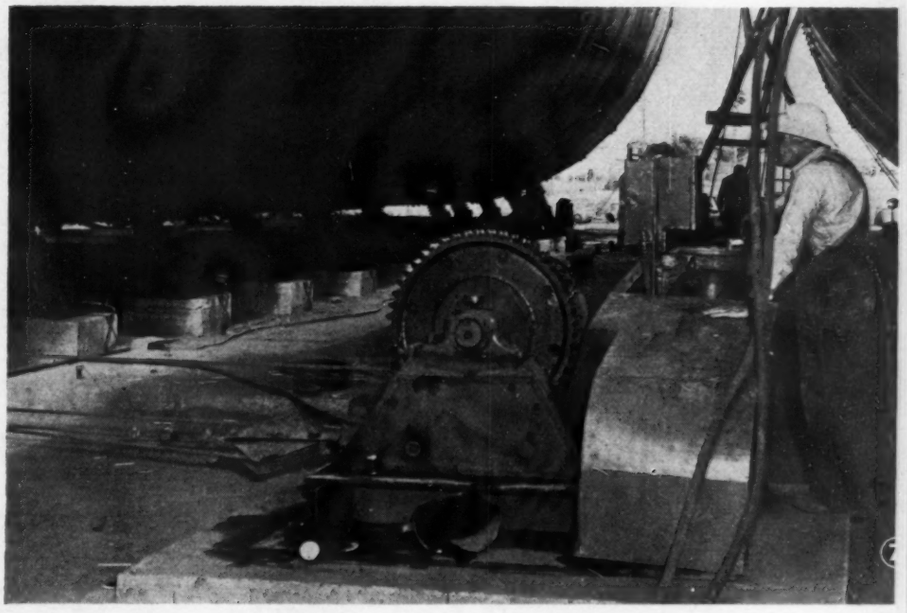


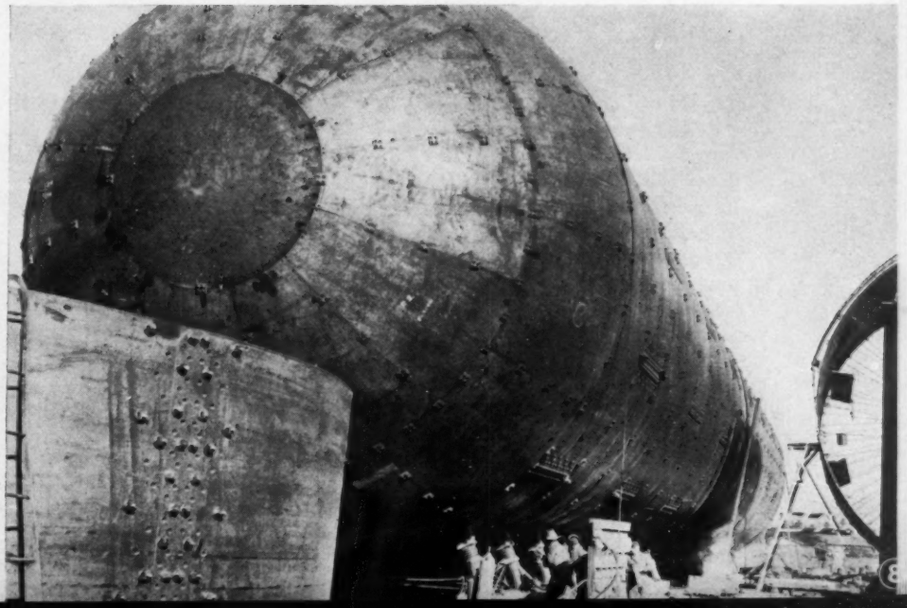
(5) W. A. Sandberg, Lacy Manufacturing Co. engineer who perfected this method of erecting the holders, stands in the foreground, hatless, watching a ring being swung into place.

Pressure Gas Holders

work. The cylindrical shell is prevented from collapsing of its own weight by a system of radial spokes which are removed after the vessel is completed. The longitudinal joints in the cylinder are riveted and the round-about ones welded.

Eight holders are to be built by this method. Their dimensions are 32 ft. in diameter and 215 ft. in length, including the hemispherical heads. Operating under 50 lbs. working pressure, they will furnish a combined effective storage capacity of 4,000,000 cu. ft.

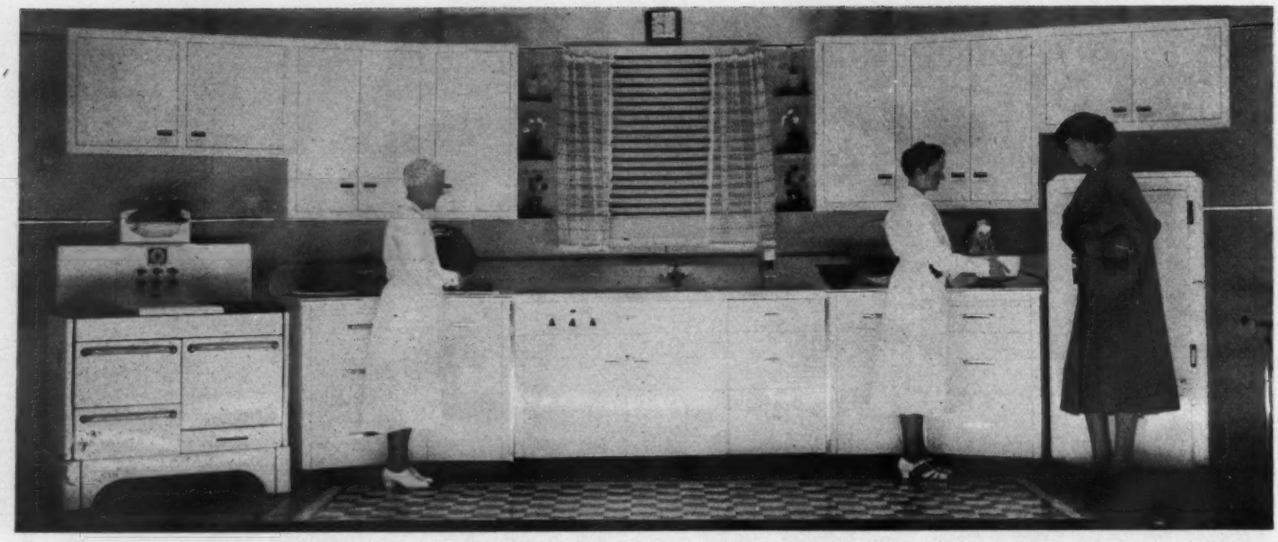




(6) Bolting up: Each section as it is brought into place is bolted to the preceding section by temporary clips. Here two workmen are setting the bolts in order that the ring may be brought into alignment.

(7) The shell is revolved on its rollers: Each round-about seam is welded both inside and out, the inside work being done on the bottom of the holder from the interior, and the outside work being on top. A cable is attached to the holder, as seen in the photograph, and the shell is revolved by a powerful electric wench, thus enabling welds to be made in a horizontal position both on top and on the inside.

(8) The shell is completed: With the hemispherical heads in place, but still resting on its rollers, a completed holder stands ready for the final operations. The clips and bolts with which the sections have been held together during welding will be removed and the bolt holes plugged; the shell will then be ready to be inflated with compressed air for testing at 110 per cent of the working pressure; next the pressure will be reduced to 60 per cent of working pressure and the ring girders welded in place; then the structure will be lowered on to the permanent foundations by reducing water pressure in the hydraulic jacks that support the rollers; and finally the radial "spokes" will be removed from the interior, and the vessel will be ready for service.



Fox Theater cooking school, Marinette, showing a model kitchen used as stage setting. Left to right: Mrs. Evalyn Tideman, Marinette home service instructor; Miss Zella Patterson, Green Bay home service director, and Miss Virginia Call.

Cooking Schools With A Theme

By ZELLA PATTERSON
Wisconsin Public Service Corporation

COOKING schools have grown in popularity until now there are hundreds of them every year. The largest and most publicized of these schools are sponsored by newspapers.

Someone may say, "But what value is a newspaper cooking school? The women only go for prizes." There is a definite value to the paper itself, and the women like these schools because they are somewhat like a home-manager's convention or rally; also there is a definite value to the local gas company if the executives of such a company see to it that an improved and authentic gas story, which will be remembered long after the school is past, is told.

A newspaper which has conducted successful schools for nearly twenty years tells us that no money is made on such a venture directly. Their reasons for the school are that the paper gains prestige through:

1. An increase in circulation.
2. A strengthening of their present subscriptions.
3. An added approach to local advertisers (as the preferred local advertising medium). These special promotions keep local advertising expenditures flowing their way.
4. Use of big shows monopolizes the attention of the local advertiser conserving cash. (Smaller advertising vendors such as radio, bill boards, direct mail and specialties find it difficult to get a foothold in the community.)
5. These schools impress the national advertiser with the excellence of their market. A huge cooking school is supposedly an evidence of healthy household interest and buying power.
6. A stimulant to entire newspaper organization.

All of these reasons are profit makers for the newspaper, although it does not make money at the time of the school.

If the gas company is going to receive its share of benefits from such a school, then it must have a genuine interest in how such a school is conducted. After all, the manufacturer or vendor of food products is interested only in hearing his story told as frequently as possible. The newspaper may care more for a Cecil B. De Mille spectacle that will bring in crowds and would as soon see a group of Ubangi maidens on the stage as the finest home economist.

Personally, having worked with newspapers in our community over a period of 12 years, we feel that the home service department can do a marvelous bit of good for the paper, the people who attend, and the gas company which it represents. Whether it uses gas equipment from the company or a local dealer, the home service department can "tell the story" so that it will be remembered.

It is flattering to say that 20,000 women attended a cooking school in your town, but it is more flattering and better for business if you can say, "Those 20,000 heard and saw the advantages of a modern kitchen with modern gas appliances in such a way they will remember it."

Therefore, if the gas company wants to make the most of the opportunity presented by a newspaper cooking school, it will be sure that the proper background is used for the setting. At one of our schools we used a background made into three rooms, dining room, kitchen, and utility room. Other schools, for which we had cupboard difficulties, had inexpensive painted beaver board with dummy cupboards for the background. The right setting has a lasting effect on the audience. They must have a picture of how a CP gas range or Electrolux refrigerator or gas water heater looks in its proper surroundings. Only then can they visualize how it would look in their home. Through the eyes comes 80 per cent of all knowledge, so what better place to "tell the story" than

on the stage, to hundreds of women who are seated for a minimum of two hours at a time. Regardless of the motive that brought them to the school, these women are there, seeing and listening.

In a large school which has many advertisers, the home economist is limited in the amount she may say about each. However, she can just as well prepare recipes which illustrate the use of the simmer-save burner, and controlled cooking surface, even distribution of heat in capacity oven baking, broiled meals, and the health, convenience, and economy of the refrigerator which is more convincing than just talking.

Each recipe made should be chosen with these features in mind as well as for economy, suitability, ease in making, appeal to the audience, and using foods advertised in the school.

Women may attend a school for "prizes" but it's a feather in our cap if, while they are there, we can really give them some cooking and ideas along the line of better homemaking. We have found that this information is very effective when presented in skit form. A contrast of old and new is not only funny when presented as "Mrs. Modern and Mrs. Antique" (not original) but gives a beautiful picture of the advantages of a CP range. "A Bachelor Cooks" shows a young man using his new gas equipment the wrong way when the home service instructor calls. "Safe at Home" is an excellent skit for the CP range because it shows a modern gas kitchen, new bride, husband, and the neighbor. It is not always possible to have two home economists for a school, but there are several ways in which one person may effectively impress her audience with the gas story. Wearing a costume representing a certain country and preparing dishes native to that country is one way.

Appropriate poems, stories, experiences, stunts, music and songs scattered through the demonstration often add to its effectiveness. Always remembering that these women are there, the show is ours and they are "putty in our hands," we can impress them with the superior qualities of gas.

Of course, it is an advertising school, but women don't mind that if it is given to them "as they like it." All of us are familiar with the magazine advertisements, "A skin you love to touch," "Dishpan hands," "Your best friends won't tell you," and "How to be glamorous." So the theme of a cooking school should be not only to tell these home managers in as many ways as possible the merits of gas cooking, refrigeration, and water heating, but show that they are fast, clean, dependable, safe, and economical, giving excellent results and making for future happiness in the home.

A large cooking school has a psychological effect on a town. During the school all of the women are busy attending, but after it is over and while it is still fresh in their minds, the sales people should call on them and do their best.

These schools make us better acquainted with our customers. Whether or not we know them, they know us and form their opinions of our company through us.

Last year at our eighth appearance in a certain town, a small boy came up to me and asked for my name. He said, "I've been reading all about you in the paper. Gee, I'll bet you're a good cook." But he added, "I'll bet you can't cook as good as my Mother." I said, "I'll bet I can't either."

In one of our schools a woman in the audience said her people were busy planting so she hitch-hiked to the school because she enjoyed it and had learned so much other years. I asked the audience if they didn't think anyone using the thumb route should be rewarded with a prize and received a loud encore of applause.

Since cooking schools are popular, let's see that they have a theme of effectively promoting the desirability and use of modern gas appliances.

1. By promoting a school having a pleasing appearance with snap and zip, it is easy to put the audience in a good frame of mind.

2. By practical methods of cooking on gas and the proper storage of food by gas refrigeration the art of good cookery and the preparation of wholesome food is brought out.

3. A proper display of gas appliances on the stage combining the above points enhances the desirability of owning such equipment in the minds of the homemakers making them good prospects for the purchase of gas appliances coupled with the fact that hot water is supplied by gas water heaters for cleanliness.

Miss Charlotte Meissner, home economist at Sheboygan, dressed in a peasant costume she has used at cooking schools.

AT LEFT:

Miss Zella Patterson, stage setting and costume of Mrs. Antique used in a contrast skit entitled "Mrs. Antique and Mrs. Modern," illustrating the deficiencies of old type ranges.

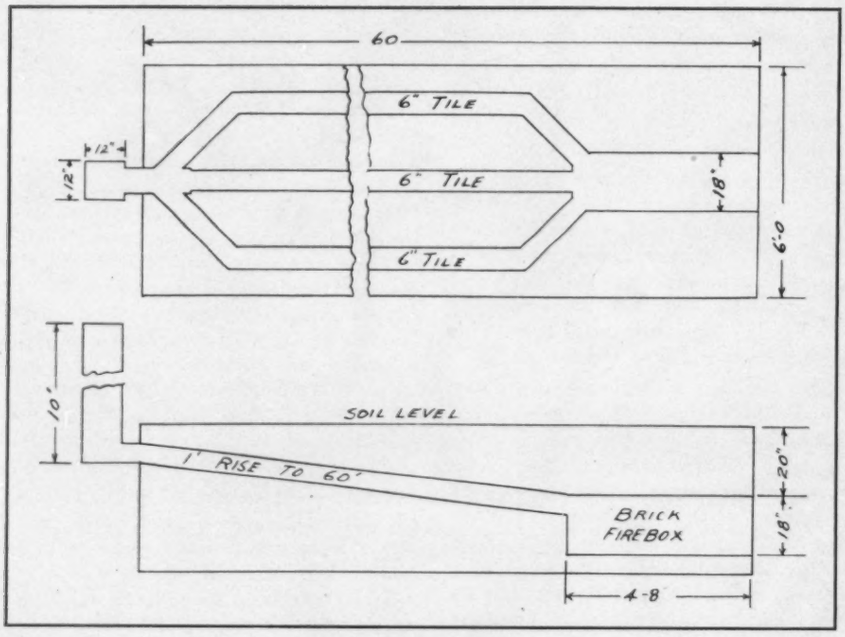


FIG. 1. Flue-heated hot beds.

Gas for the Flue and Pipe Heating of Hot Beds

By EDWARD A. BARTOLINA

Engineer, Consolidated Gas Utilities Corporation, Blackwell, Okla.

ARTIFICIAL heating of hotbeds has been accomplished by the construction of what is known as a flue-heated hotbed, or by a pipe-heated hotbed.

The flue-heated hotbed is by far the less expensive to install and there are several designs of this type of bed that have given satisfactory service. A common method is to build a furnace at one end of the hotbed with a flue extending lengthwise under the frame to a chimney at the opposite end. A floor is placed 6 to 12 in. over the flue, which allows the air to circulate in the space between the flue and the floor of the bed, thus warming the soil above.

E. A. BARTOLINA

The type of flue-heated hotbed shown in Fig. 1 and used by the Mississippi Agricultural Experiment Station is less expensive but still workable. This hotbed has a brick furnace, and three lines of 6-in. drainage tile extending from the fire box to the chimney. The two outside lines of tile are placed 6 in. from the sides of the frame and the other one in the center. At the point where the three lines join the furnace, three small flues are built, one from each corner at an angle of 45 degrees, and a third from the center as shown in the figure. The sides and ends of the bed are made of 2-in. boards. The chimney may be made from four 1x12 in. boards, providing the bed is used only for late spring crops such as sweet potatoes. If heavier firing is to be done in the early spring, non-inflammable material should be used for the chimney.

The tile and furnace at the fire box end of the bed should be covered 18 to 20 in. deep with soil, and 6 in. deep at the chimney end. The soil surface should be level in the frame. In laying the tile flue, 1 ft. rise is given to every 60 ft. The most desirable length for this type of bed is 50 to 60 ft.

The pipe-heated hotbed, while the initial cost is much higher than that of the flue-heated bed, will afford more satisfactory operation as it is a simpler task to control the temperature of the soil at the desired level.

In the installation described in the following paragraphs, the problem was to lay out a heating plant that would heat 15 sweet potato plant hotbeds, each 6 ft. wide by 150 ft. long, to a temperature of 80°F., during the months of March and April, and size the equipment so it would take care of an additional 15 beds of this size. It was decided to use hot water as the heating medium, with forced circulation, and an open system, and that a boiler having a rated output of 675,000 B.t.u. per hour would do the job of heating all 30 beds in this particular vicinity. The size of the boiler was based on a heat loss of 2500 B.t.u. per hour, per 100 sq. ft. of soil surface to be heated when the temperature of the soil was 80°F., and the temperature of the atmosphere was 40°F., a difference of 40°F. This figure afterwards proved to be ample. It was then decided to bury 1-in. pipe coils in the beds to a depth of 16 in. and spaced 18 in. apart. The south end of the pipe coil was connected to the supply main and the north end to the return main. The pipe was sized to handle the entire load against a maximum head of 6 ft. of water and a 20° temperature drop through the system. The water circulating pump installed, in this specific instance, is capable of handling 67 gals. of water per minute against a 6-ft. head.

As the control of the soil temperature was of vital importance, it was thought the temperature of the soil could be maintained at the desired point by means of a remote controller, the bulb of which would be buried in one of the beds at the same depth at which the potatoes were planted, provided that the system could be balanced by the stop cocks inserted in the inlet and outlet of the coils. This, however, proved impractical for several reasons. In the first place it would be impossible to plant all of the beds at the same time and, therefore, some of the beds would require heat while others would not. In the second place, it is practically an impossibility to balance the system so that each coil receives its proportionate share of water and thus assure the same temperature in all of the beds. The recommendation therefore would be to install a thermostat in each individual bed that would operate an electric water valve placed in the inlet of the 1 in. pipe coil. This, then, would make the plant completely automatic, and it would thus require no attention.

This particular plant was first placed in operation March 18, 1939, and was shut down May 1, and the plant consumed 350 M c.f. of gas which had a heating value of 1040 B.t.u. per cu. ft. The average outdoor temperature during this period was 57°F.,

which indicates that a figure of 2200 cu. ft. of 1000 B.t.u. gas is necessary to grow 100 sq. ft. of sweet potato plants, for each 20 degrees differential between the temperature of the soil and that of the atmosphere.

The lowest temperature recorded was 32°F. Each of the beds was covered with several inches of straw before the plants came up through the soil and the beds were covered with muslin during the days when there was danger of frost killing the plants.

The frame for the beds consisted of corrugated, galvanized iron fastened to wooden posts driven into the ground. The corrugated iron reflected the sun's heat onto the hot bed. Since more solar energy is reflected by the frame to the north side of the bed, it is necessary that the hot water inlet be on the south side in order to insure a uniform temperature throughout the bed.

The above installation worked very satisfactorily, and as long as the soil is maintained at the proper level the results achieved are superior to those of manure heated beds. The plants can be grown earlier and much faster, and all danger of the plants being killed by frost is eliminated. It also eliminates the need for purchasing manure or synthetic fertilizer each year. It is also possible to sterilize the soil in the hotbeds by raising the temperature of the soil (after the plants are removed) to the point that all organisms and disease germs are killed, and thus eliminate the expense of removing the soil and replacing it with germ-free soil every year.

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Measurement Short Course Will Meet in April, 1940

The 1940 Southwestern Gas Measurement Short Course will be held at Norman, Okla., under the auspices of the College of Engineering, University of Oklahoma, April 16, 17 and 18.

Dates for the short course were fixed at a meeting of the general committee at Dallas, Texas, November 19. Fay C. Walters, Kansas City, Mo., chairman of the general committee, presided. Twelve members of the committee attended, including W. H. Carson, Norman, dean, College of Engineering, University of Oklahoma, and Miss Kate A. Niblack, Oklahoma City, secretary, Oklahoma Utilities Association, both from Oklahoma.

Plans were made for the 1940 short course, and provisions made to fill committee vacancies. These will be announced later.

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San Diego Co. Cuts Rates Eighth Time in Five Years

A general rate reduction, the eighth in the five-year period 1935-1939, was put into effect Nov. 1 by the San Diego (Calif.) Consolidated Gas and Electric Co. This will amount to an annual saving of $108,450 for gas consumers.

Use of City and Natural Gas for Metal Cutting

• **CARL WIERUM, Brooklyn Union Gas Co., Brooklyn, N. Y., presented a paper before the American Gas Association Annual Convention in New York on the "Cutting of Metal with City or Natural Gas." The gas industry has perhaps not fully realized the possibilities of metal cutting applications as a source for load. This may be due to a lack of practical information on both technique and costs, and Mr. Wierum's discussion contributes toward the alleviation of this condition.—(Abstract by G A S.)**

THE subject of city gas for steel cutting, replacing acetylene, is not new by any means. Of late, however, there has been evidence of a revival of interest, as it has become more and more apparent that this field represents a natural and logical outlet for our fuel. It is difficult to estimate the total potential load possible, but there is every evidence that it can be considerable. The growth of flame cutting as a process has been pronounced in the last few years. In many plants it has taken the place of casting or forging intricate shapes, and flame is being used extensively for machine turning or milling, billet scarfing, descaling, and removing risers from large castings. Furthermore, when a gas company starts to investigate the whole general field of replacement of acetylene, hydrogen or other bottled or generated fuel gases, more applications will probably be found than were originally thought of. There are still immense quantities of bottled fuel gases being used for lead burning, running babbit metal in bearings, silver soldering, brazing, etc. — all of which processes could easily be done with compressed city or natural gas and oxygen, and at considerable saving to the customer.

The above processes are also being done to a large extent already with city gas. The biggest field for our industry in new promotional work with oxy-gas torches is undoubtedly that of steel cutting, in all its various uses. That this business can be had is evidenced by the number of large plants now using city gas for this purpose.

An approach to the problem of selling city gas to any given prospect must consider the different variables involved from the standpoint of:

1. The prospect's present practice in cutting.

2. That factor which is to him the most important. In some cases this will be speed, in others neatness of cut; in others economy. This approach is most important, as the conditions found in one plant may vary widely from those in another plant, even if similar work is being done.

Variables to be analyzed follow:

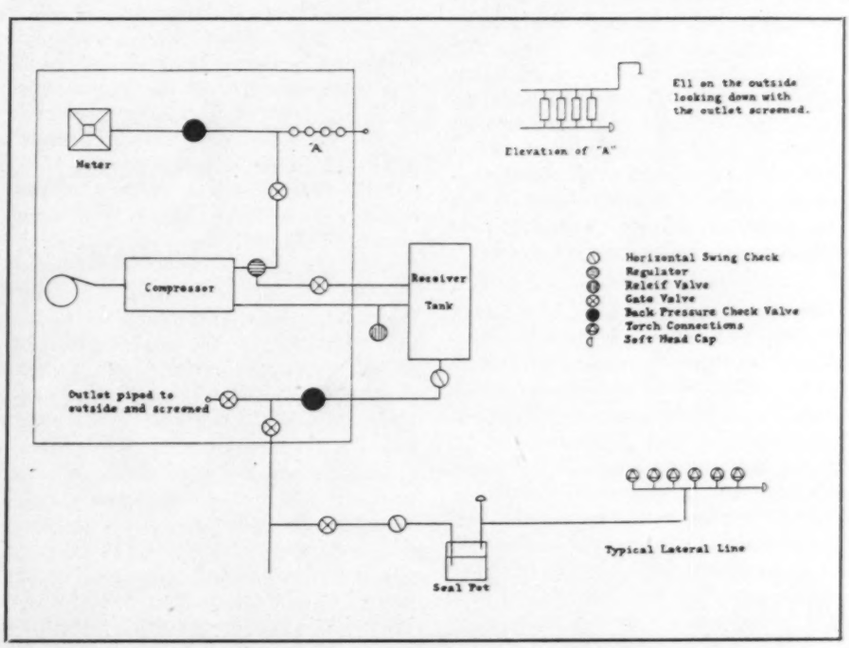

FIG. 1. Typical layout of protective devices for use of city gas with oxygen for cutting. Note that water must be drained regularly from receiver tank. Winter protection from freezing necessary.

TABLE NO. 1

Thickness in Inches	*Speed Ft. Hr.*	*Oxygen Pressure*
¼	110	17
½	92	25
1	66	40
2	47	50
6	27	60
12	16	80

TABLE NO. 2

Thickness in Inches	*Speed Ft. Hr.*	*Oxygen Pressure*
¼	95	15
½	85	25
1	55	35
2	31	45
6	25	60
12	9.5	80

1. *Speed.* Table No. 1 shows recommended speeds and oxygen pressures for machine cutting up to 12 in., and Table No. 2 for hand cutting.

Increasing the oxygen pressure will permit greater speeds at the expense of smoothness and neatness of cut. In general, the drag should be as long as possible consistent with the prospect's requirements of smoothness and kerf width. In using these tables, the speed that the customer has been using is the governing factor, not what we think he should use. There should not be the slightest difficulty in equaling the speed of an acetylene torch.

2. *Starting speed.* A fair estimate is about 1½ times the speed of acetylene. In blowing through, a small nick or burr with a cold chisel will help enormously. This also holds true in starting a cut on a round. Where long cuts are being made, starting time is negligible and cannot possibly outweigh the other advantages of city gas.

3. *Oxygen consumption.* It is obvious that if a city gas torch is supplied with cutting oxygen at the same pressure and through the same size orifice, it can consume no more oxygen for cutting purposes than a torch using any other fuel. Inasmuch as approximately two volumes of oxygen are required to burn one volume of acetylene, whereas only one volume of oxygen is required for one volume of city gas, there should be no appreciable difference in the oxygen requirements of the preheating flames.

4. *Gas consumption and pressure.* Whereas in considering the other variables of oxygen cutting, we can be guided somewhat by acetylene practice, there is no such criterion in setting our gas pressures and consumptions. So far, in our rather limited experience, it is generally agreed that whereas low pressure torches using gas at 4 to 8 in. water pressure will cut steel, such torches will not approach the performance of acetylene torches. Preheat time will be abnormally slow and, in order to improve this, an excessive amount of oxygen will be used.

The use of city gas for cutting has attained wide acceptance in Baltimore. Experience there seems to indicate that 12 lbs. per sq. in. is the gas pressure which gives the most uniformally good results. Pressures of from 4 lbs. up to 20 have been used. Increasing the gas pressure will reduce preheating time. If the gas pressure is increased beyond the maximum permitted by the torch design, however, any gain in time may be offset by an increase in oxygen consumption.

5. *Quality of cut.* The smoothest cut will be obtained by using low oxygen pressures and slow speeds. This also reduces slag formation. In this respect many users have reported gas to be superior to acetylene.

In laying out a gas cutting installation it is very important that all possible precautions be taken to prevent the back flow of oxygen, and to isolate any minor flashback that may occur in the distribution system. Fig. 1 shows the safety equipment incorporated in gas cutting installations in several Baltimore plants.

Flame Differences

It must be borne in mind that there is a wide difference in the appearance of the preheating flames as produced in an oxy-acetylene torch and those produced in an oxy-city gas or oxy-natural gas variety. In the case of the oxy-acetylene flame, there is a very clearly and well defined preheating flame. This is comparable and the same in every respect as an ordinary welding torch flame. On the other hand, the oxy-city gas or oxy-natural gas flames are *not clearly defined* when properly adjusted, although it is possible to so adjust a torch that they have the appearance of being very clearly defined and very similar in appearance to the oxy-acetylene flame. When so adjusted, the preheating flame will not function. The correct oxy-city gas or oxy-natural gas preheating flame has a length of from 3/16 to 1/4 in. and it is very important to note that if the flame is not precisely properly adjusted, success will not result. In other words, if the flame is over-adjusted or under-adjusted, so to speak, the results will not accrue. There is a point at which the oxy-city gas or oxy-natural gas is practically as fast as oxy-acetylene in every sense of the word. He who is handling an oxy-city gas or oxy-natural gas torch for the first time must expect to do a little bit of experimenting in order to attain efficiency in the adjustment of the flame.

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Addison B. Day, California Gas Leader, Passes

ADDISON B. DAY, retired chairman of the Board of Directors of the Southern California Gas Co., Los Angeles, passed away in Los Angeles on November 29 at the age of 65. Mr. Day's death came as the result of a stroke suffered on July 18.

A. B. DAY

Mr. Day was born in Chicago in 1874, coming to Los Angeles in 1886, where he finished his schooling. He first became affiliated with the gas industry in 1895 and for many years served as president and general manager of the Los Angeles Gas and Electric Corp. In 1937, following the merger of that utility with the Southern California Gas Co., he became chairman of the Board of Directors of the combined company, a position held until his retirement on September 1 of this year.

During his career he had been active in both the American Gas Association and the Pacific Coast Gas Association, having served as a director of the former organization and as president of the latter organization in 1920. He was a director of the Industrial Fuel Supply Co., and of many other Los Angeles organizations, both civic and industrial.

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Natural Gas Leaders For 1940 Announced by A.G.A.

According to a recent announcement made by the Natural Gas Section of the A.G.A., the following chairmen have been appointed to head the committees named:

Natural Gas Production: J. French Robinson, Peoples Natural Gas Co., Pittsburgh.

Natural Gas Transmission: George C. Young, Michigan Gas Transmission Co., Detroit.

Industrial Natural Gas Sales Committee: Franklin T. Rainey, The Ohio Fuel Gas Co., Columbus.

Domestic Natural Gas Sales: Davis M. DeBard, Stone and Webster Service Corp., New York City.

Engineers' Committee on Industrial Gas Data: George M. Parker, Mississippi River Fuel Corp., St. Louis, Mo.

Institutional Advertising Data: H. V. Potter, Oklahoma Natural Gas Co., Tulsa.

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Line Built To Garrison

A new 31-mile, 6-in. pipe line from the Joaquin gas field in Shelby County to Garrison, Texas, is being constructed by the Natural Gas Distributing Corp. It is planned that eventually the line will be extended to Lufkin, Texas, a distance of 21 miles. This company is also making a new test in the Joaquin area.

Plans Formed for Founding of Gas Research Institute

• **FRANK C. SMITH, president of the Houston Natural Gas Co., Houston, Texas, is chairman of the American Gas Association's Special Committee on Fundamental Research. Herewith presented are excerpts from that committee's report before the 21st Annual Convention of the American Gas Association in New York City, October 9-12, 1939.—(Abstract by G A S.)**

A SPECIAL committee was appointed four months ago to study the subject of Fundamental Research. This Committee has conducted its study and investigation, has formulated its plan, and has reported to the Executive Board.

The Committee of 14 members includes seven members of the American Gas Association Board of Directors, three of whom are former presidents of the Association. It is thoroughly representative of the manufactured and natural gas industry. It met in New York in July and interviewed distinguished men in the world of industry and research, some of national renown and all of recognized and outstanding ability, and met again in August and put together into a plan the elements of what had been learned.

What Research Means

It is well known that valuable and resultful work has been done in the fields of gas transmission, metering, appliance development, pipe joints and the like. This is what is generally accepted as applied research, relating to the tools of our trade. Valuable work has been done in the Association's Testing Laboratories at Cleveland and by private concerns which have been working in fields of applied research either on their own hook or under the commission of the American Gas Association. This work has been going on to some extent and with some success. It has but little to do with the sort of research vizualized by the Committee. Research is a very much-abused and over-used word. The job of developing and improving equipment and methods *toward ends already accomplished* belongs in the experimental laboratories of equipment manufacturers. This is development, *not* research. Research may be said to take up where development leaves off.

Research has been well defined as "an organized method of trying to find out what you are going to do after you can't keep on doing what you are doing now." No reason is seen why we cannot go on doing what we are doing now, that is, sell gas for the few simple purposes to serve in the comparatively few known fields of its use. The definition the chairman suggests is "research is an organized method of trying to find out what we are going to do in addition to what we are doing now."

Briefly reviewing the findings of the Committee at its two meetings and through its study in connection with the meetings, there was found, first, a vital and immediate need for a program of research in behalf of the gas industry; *vital*, because the life of the industry is affected, and *immediate*, because the Committee believes that steps must be taken at once if results are to be expected in time to assure continuance of the industry's profitable existence. The Committee believes that the industry should not wait for illness to overtake it and then attempt drastic cures. Second, we have learned that there are, broadly, three methods whereby industry has conducted research programs successfully: (a) by providing research fellowships directed toward specific objectives; (b) by a research laboratory, provided, financed, manned and managed by a unit of an industry, such as the General Electric Co., and (c) by a research institute, sponsored, organized, financed and managed and operated by several or many members of an industry, responsible to a Board of Directors or Trustees representative of the industry, comprised of a selected technical personnel, under the management of a research director, with independent operation assured for a period of years.

The Committee believes that the adoption of an adequate research program will go far to reassure industry and investors that the gas industry is not on a decline, but is on the upgrade with an alert leadership, mindful of the need of new development.

Immediate Establishment

A plan has been worked out which will provide a broad concept and a complete research set-up for the gas industry. Briefly, it provides for the *immediate* establishment of the Research Institute of the Manufactured and Natural Gas Industry, the construction of its skeleton structure and employment of its Director and the subsequent careful set-up of the organization, its location, personnel and educational affiliation.

The prime purposes of the Research Institute of the Natural and Manufactured Gas Industry would be the conduct of fundamental research, the coordination of gas industry researches, the correlation of all results of interest to the gas business, and the education of selected students in special subjects so that, upon graduation, they would be available for employment in the industry and be especially qualified to interpret to practical application the results of research. It would be as serviceable as possible in all matters concerned with gas industry research, acting as a sort of "clearing house" for research information and services of all kinds, such as an actual or advisory one concerning the related information to, the feasibility of, the best laboratories for conducting, and other useful aids for, research projects contemplated by companies, gas associations, et cetera.

Corporate Structure

The plan provides for a non-profit corporation of various classes of members of the gas industry, represented by a Board of Trustees, officers and a Director. Under the plan, support of the Institute is to be furnished by individual members, who pay nominal annual dues, and by company members, both utility and equipment, variously classified as Founder Members, Sustaining Members and Associate Members, which latter three classifications shall pay amounts equitably arrived at and pledged as an annual contribution for a period of, say, 10 years. Management of the Research Institute will be vested in a Board of Trustees, elected from the representatives of supporting company members, 15 in number, eight from the gas utility business, four from the equipment manufacturing business, two who might be engaged in other lines of endeavor and one who would be the Director of the Institute.

The plan contemplates coordinated activity in a wide field. In addition to providing a means of fundamental research, it provides also for the coordination of and a *means* of carrying on industrial or applied research.

The proposed Research Institute will also include a school for selected graduate students, conducted in conjunction with some existing technical institution of national standing.

Southern Counties Develops A Felt Type Dust Filter

• F. H. WINSLOW, Southern Counties Gas Co., Los Angeles, Calif., in a paper, "A Felt Type Gas Filter," presented before the 46th Annual Convention of the Pacific Coast Gas Association held at San Francisco, Sept. 6-9, 1939.—(Abstract by GAS.)

THESE filters are made in three different sizes and are known as 12-in., 16-in., and 22-in. The size refers to the pipe diameter used for encasing the filter bags, the standard inlet and outlet pipe connection being 3-in. for the 12-in. filter and 4-in. for the 16- and 22-in. When high pressure gas is filtered the connection size is reduced accordingly. The capacity rating is 4 cu. ft. of gas per hour per sq. in. of felt, which gives a drop of about 1/10-in. of water at usual operating pressures. A 98 per cent colored, 1/8-in. thick, wool felt is used. Due to the construction (Fig. 1), the outlet must remain in the one place, but the inlet may be moved to any location, preferably above the filter bag support.

The standard filters are made for 125 lbs. working pressure. The 12- and 16-in. sizes are also made for 250 lbs working pressure, but it was not found practical to make the 22-in. for 250 lbs. due to the resulting weight and size. Also, the cost of servicing would be considerably increased.

Filter Bag Supports

The filter bag supports are cast iron requiring no machine work other than drilling and tapping of holes for the relief valve or blind and the lug supports. An eye is cast in the top to facilitate the removal of the bag support for cleaning.

The outlet connection on the filter protrudes inside the filter for 3/4 in. and the outlet of the filter bag support is faced to this outlet with a rubber gasket between them. A cast iron spider having a counter-sunk hole is set into the inlet, and a jack screw is set between these which, when expanded, seats the bag support to the outlet connection.

Felt cylinders of the proper diameters are made up by lapping the felt about 1/2 in. and gluing the lap with DuPont's household cement. This lap is then sewed with a Bostitch stapling machine, which was made specially for this work. After sewing, the lap is again glued to seal the stitch holes.

The smaller cylinder is fastened to the bag support by first gluing the end then wiring it in a manner similar to the diaphragm ties on a meter. The projection is slightly rounded so that the tie wires tend to pull the felt to the center of the groove to make a tight joint.

A double cylinder wire cage 18 in. long, made out of 5/8-in. square mesh, 16-gage, double crimped, galvanized wire; separated and supported by 1/2-in. galvanized pipe, is used to separate the felt cylinders and hold them apart. This cage is fastened to the bag support by tie rods which are hooked over the bag support and pass through the 1/2-in. pipe. The bottom of the rod is threaded and by tightening up against the pipe the cage is held rigidly in place.

The next larger felt cylinder is then fastened to the bag support by the same method as the first, the felt cylinders being about 2 in. longer than the wire cage. They are sewed together at the ends by the same method used on the sides. This makes a complete double cylindrical bag sealed at the bottom, which requires the gas to pass through the felt, and into the bag support, then to the outlet.

The construction and assembly description thus far applies to the 12-in. filter. The 16- and 22-in. sizes are filter. The 16- and 22-in. sizes are identical except for size and the addition of one more larger cylindrical bag for the 16-in. and a still larger and additional bag for the 22-in.

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FIG. 1
Southern Counties Gas Co. 22-in. gas filter.

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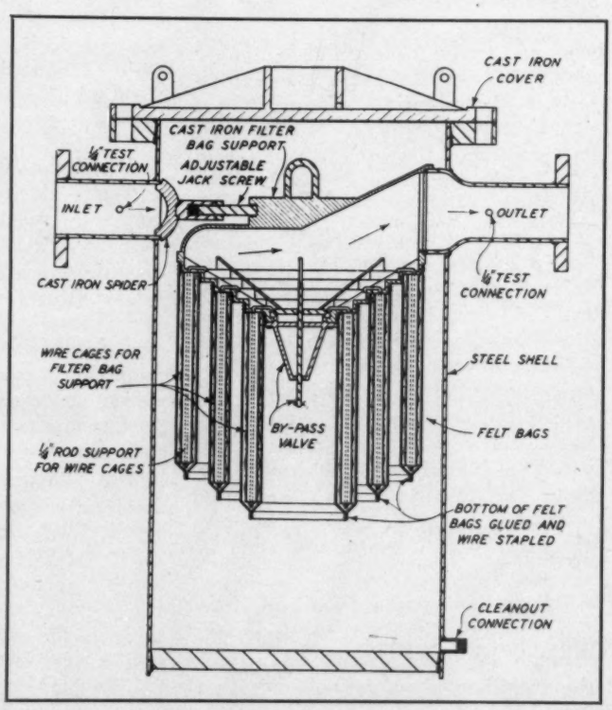
The bag supports are made in progressive steps so that each felt cylinder can be tied on, and since the felt cylinders are all cut the same length (20 in. long), the 16-in. and 22-in. filter bags appear shorter as the size increases.

There was some concern that the felt might become clogged and possibly collapse the cylinder or cause excessive pressure drops. For this reason, it was decided to install a relief valve to protect certain installations. This relief valve has a knife edge valve and a soft composition disc weighted to relieve at about 5-in. water pressure. It is installed in the center of the bag support and is held in place by four cap screws. When this valve operates, it bypasses the felt bags and passes the gas directly into the outlet. Filters installed on consumers' meters do not have relief valves and on these the opening is blinded off. It is assumed that should a filter start to clog up, the consumer would complain before any outage would occur.

Case Construction

The outside case or body is made from standard weight pipe having a flat head welded into the bottom for the 125-lb. filters and a dished head for 250-lb. filters. The top is a standard size flange and blind for the 12- and 16-in. filters, with handles welded on for servicing. The 22-in. blind is cast with ribs for reinforcement and is also heat-treated to increase the tensil strength. This is done to cut down the weight, since a flat blind steel plate would weigh about twice as much as the ribbed cast iron blind. The inlet and outlet connections consist of standard welding flanges welded to the sides and equipped with 1/4-in. openings on



each side so that the service man may obtain the pressure drop across the filter.

A ¾-in. blow off connection is installed at the bottom to drain off condensate. No attempt has been made to use this as a method of cleaning out the dust, as past experience has shown that the dust tends to pack and is not readily moved without agitation.

The 12-in. filter weighs 420 lbs. and contains 940 sq. in. of felt. It is rated at 3800 cu. ft. of gas per hour at 8 in. of water pressure, and costs about $74.

The 16-in. filter weighs 598 lbs. and contains 2450 sq. in. of felt. It is rated at 10,000 cu. ft. of gas per hour at 8 in. of water pressure and costs about $110.

The 22-in. filter weighs 900 lbs., contains 4630 sq. in. of felt, and is rated at 20,000 cu. ft. per hour at 8 in. of water pressure. It costs approximately $165.

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Natural Gas Companies Must File Semi-Annual Reports

The Federal Power Commission has announced that in accordance with Order No. 65, adopted October 17, 1939, every natural gas company must report semi-annually and file with the Commission pertinent data and information with respect to the transportation and sale of natural gas in interstate commerce under each separate rate schedule in effect and subject to the jurisdiction of the Commission. Form No. 141 is to be used in submitting the required information to the Commission.

The reports must regularly be filed on or before February 28 and August 31 of each year for a six-months period preceding and ending on December 31 and June 30 respectively, but the first detailed data with respect to the transportation or sale of natural gas for the six-months period ending June 30, 1939, must be filed on or before December 15, 1939.

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Oklahoma Natural to Serve Wagoner, Jenks, Muskogee

The Oklahoma Natural Gas Co., Tulsa, has taken over the gas distribution in Wagoner, Jenks, and Muskogee, Okla., following a showing, in a commission hearing November 14, that it was ready and able to carry out this responsibility.

Charles H. Albers, receiver of the Chicago Bank of Commerce, owner of the physical gas distribution properties of the Cherokee Public Service Co., and the Municipal Gas Co., was given authority, in an order of the Oklahoma Corporation Commission issued November 16, to discontinue giving gas distribution service in the three cities.

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Jamestown To Be Served Gas

The State Railroad and Public Utilities Commission of Tennessee recently approved the formation of a natural gas company to serve Jamestown, Tenn., and vicinity. Approval was also granted to the Brandon Development Co., for the construction of pipe lines and distribution system and for an RFC loan. The Brandon company has developed four gas wells near Jamestown.

Perhaps Your Customers, too, Will Rent Hot Water

• **HAROLD LUND, sales supervisor, Central Illinois Electric and Gas Co., Rockford, Ill., in a paper, "Gas Water Heating," presented before the Illinois Public Utilities Association, Springfield, Ill., October 5 and 6, 1939.—(Abstract by GAS.)**

IT IS widely realized that next to the cooking load, water heating is most vital to the gas industry and that this load can be retained and promoted only through the furnishing of a reliable and constant supply of hot water at reasonable cost, which means, particularly in the manufactured gas field, the utilization of slow recovery automatic heaters.

Prior to 1933, the company had only about 1000 automatic heaters in use on 20,000 meters and during the first nine months of 1933, despite extensive activity by salesmen and employes, only 32 heaters were added.

Due to our selling and installation policies, local plumbers were antagonistic, and would push almost any kind of water heating in preference to gas.

At a conference, the middle of 1933, at which managers, salesmen and service representatives expressed themselves freely, the following facts were agreed upon:

1. Water heating rates were too high to suit the average customer.
2. Quick recovery heaters were, even with lower rates, too expensive to operate.
3. Customers could not afford to pay for increased gas usage and at the same time carry large monthly payments on heater purchases.
4. Plumbers, through their contacts and associations with our customers, were necessary if substantial results were to be obtained.

As an answer to the above, the Rental Plan was evolved, starting with $1.00 per month over a six-year period and gradually being raised to $1.50 per month to take care of increased heater costs and to shorten rental period to five years.

The company uses a special rental contract which places no responsibility on the customer to keep the heater, automatically gives title when all rentals are paid and insures free servicing, except abuse during rental period.

After much consultation with the Master Plumbers Association, a definite contract was entered into which gave the members of the association

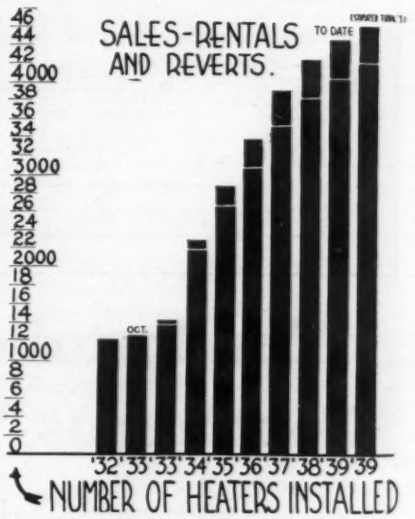


FIG. 1. Sales Rentals and Reverts.

the installation of all heaters sold by them or prospects turned in and sold by company salesmen, and permitted plumbers to buy heaters at cost to the company, plus 10 per cent. Installation of company-sold heaters is rotated.

The effectiveness of this cooperative plan is evidenced by the volume of heaters that has been maintained, particularly during the last two years when economic conditions necessitated a two-thirds reduction in the sales force. Plumbers have accounted for about 30 per cent of all heaters put out. Heaters are furnished free to plumbers for floor and window displays.

The optional gas rate, available to all users of automatic heaters, provides a 79c rate for all gas (572 B.t.u. coal; 547 B.t.u. water gas) used over 3200 cu. ft., and has been helpful not only in the sale of new heaters but also in getting back in service many heaters discontinued due to high bills.

A rigid collection system, through which the company either gets the rental payment or takes the heater out, has enabled keeping our rental account delinquencies at a minimum at all times. This rental account is entirely separate from our merchandising. All costs of putting out heaters are charged to it and all rental payments credited to it. Our faith in the rental plan is evidenced by the consistency with which it has been applied for almost six years and the general results obtained will best be shown by Fig. 1.

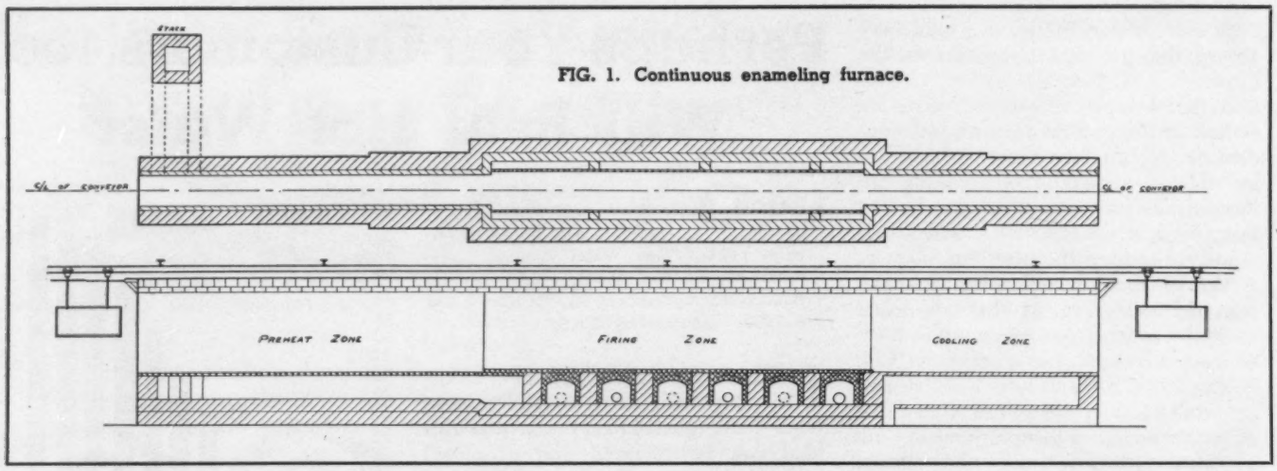


FIG. 1. Continuous enameling furnace.

The Installation of a Large Gas-Fired Continuous Vitreous Enameling Furnace

• **A. F. MICHAEL, Southern California Gas Co., Los Angeles, Calif., in a paper, "Continuous Vitreous Enameling Furnace," presented before the 46th Annual Convention of the Pacific Coast Gas Association, San Francisco, September 6-9, 1939.—(Abstract by G A S.)**

ONE of the newest and most modern examples of vitreous enameling furnace equipment is the continuous enameling furnace built by the Albert J. Boland Co. for the U. S. Porcelain Enameling Co. in Los Angeles. A general idea of the structural features of the furnace, which is the largest of its kind west of the Mississippi River, can be had from the accompanying sketch, Fig. 1. It is essentially a rectangular tunnel open at both ends, with refractory lined brick walls varying from 1½ to 2 ft. in thickness. It is approximately 82 ft. long, has a maximum height of 12½ ft., and varies in width from 6 to 9 ft. The tunnel in which the ware is processed is a straight tube approximately 32 in. wide by 7 ft. high, running the entire length of the furnace. The top brick-work of the furnace forms the top of the tunnel.

Top Brick-Work Divided

This top brick-work is divided along its center line by a slot about 2 in. wide, which has the effect of splitting the top of the furnace in half. Ware is carried through the tunnel on hooks projecting downward through the slot from the trolleys of a motor driven, variable speed mono-rail conveyor, which is supported just over the furnace on steel framework. A shield composed of overlapping sheet steel plates mounted on the conveyor hooks closes the slot, thereby reducing heat loss and protecting the conveyor from the intense heat of the furnace. These plates and the hooks which carry the ware are made of special heat-resisting nickel-chrome alloys. The conveyor, which is approximately 270 ft. long, makes a continuous loop between the furnace and the room where the ware is handled.

From an operating standpoint, the furnace is made up of three sections, namely, the preheating zone, the hot or firing zone and the cooling zone.

The first 30 ft. of the furnace constitute the preheating zone. Hot gases, on their way from the firing zone to the stack, pass under a floor of silicon carbide refractories in this section and heat the incoming ware from room temperature to temperatures approaching those in the hot zone.

The next 32 ft. of the furnace constitute the hot or firing zone. This section is completely muffled with silicon carbide refractories and is heated with six gas burners firing into tunnels under the floor. The hot gases from the tunnels pass up through passages back of the side walls and out along the top of this section. Here the ware is heated up to the fusion temperatures of the porcelain and actual firing occurs.

The remaining 20 ft. of the furnace constitute the cooling zone where the temperature of the ware is gradually dropped several hundred degrees before it comes into the cold air of the furnace room. This section is lined only with fire clay refractories.

Natural gas, at a pressure of approximately 4 in. of water, is supplied to the furnace through two premix blower units. One of the blowers supplies fuel to two 3-in. burners equipped with flame retention nozzles which fire from opposite sides into the first two tunnels at the forward end of the firing zone. The other supplies four 2½ in. nozzles firing from opposite sides into alternate tunnels in the center and at the discharge end of the firing zone. Thus, heat is evenly distributed.

Firing Control

Firing control is effected by means of motor driven proportioning valves of a variable cam operated type, which control both the gas and air supply to the blowers. These proportioning valves are so set that a minimum fire is maintained at all times. Safety valves, electrically operated from the same circuit which supplies the blower motors, are placed in the gas supply line just ahead of the blowers, assuring positive shut off of the gas supply in the event of power failure. The proportioning valve motors are individually operated from a potentiometer controller, of the two-point recording type, giving separate control of temperatures at each end of the firing zone. This permits of much more flexible control of furnace temperatures.

The U. S. Porcelain Enameling Co. processes a wide variety of articles, ranging in size from small items of household equipment to large metal signs and cabinet parts. The enamel is sprayed onto sheet steel and cast iron forms in a series of coats, begin-

ning with the ground or bonding coat, and ending with one, two or more finish coats. Each coat is, in general, given a separate firing, the time and temperature of which are determined by the kind of metal, the gage, the size of the pieces, and the nature of the coat. Throughout these operations, control of firing is very important, as too little or too much firing, or too low or too high temperatures result in imperfect enamels. The firing time is governed by the speed of the conveyor, which has a maximum range of from 2 to 18 ft. per minute. Firing temperatures are controlled within close limits by the controller. In the common run of work, steel parts are fired at temperatures between 1480° F. and 1550° F. at conveyor speeds of 7 to 10 ft. per minute. Cast iron parts are fired at 1300° F. at a conveyor speed of 2½ ft. per minute.

The capacity of the furnace from a practical viewpoint appears to be limited only by the amount of ware which can be placed on the conveyor and the speeds at which it can be run for satisfactory firing. It has handled easily up to 3000 sq. ft. of coated surface per hour on steel averaging 2 lbs. per sq. ft. During production hours gas consumption averages about 6500 cu. ft. per hour.

Observations and available data lead to the conclusion that the consumption of gas is principally determined by furnace temperatures, and that the amount of ware passing through has only slight bearing. For this reason, consumption-production ratios have little or no meaning. To avoid possible serious damage due to expansion and contraction stresses, the furnace is kept hot all the time. It is never cooled below 1300° F. Maintaining this minimum temperature requires from 2500 to 3000 cu. ft. of gas per hour during non-working hours. The total daily gas consumption on present production schedules averages about 100,000 cu ft.

Prior to the installation of the continuous furnace, this company operated three box type batch furnaces, each with a 5 by 11 ft. hearth. These have been replaced by the new furnace which has many times their capacity on about the same amount of fuel, with the same number of employes.

Due to the new furnace, the quality and appearance of product has been greatly improved. The gradual heating and cooling and the close control of firing, produce an enamel with more gloss, a tougher finish with a much greater resistance to thermal shock, and a finish less liable to chipping under strain.

Controlled Atmospheres for Heat Treatment of Copper

• CONSIDERABLE PROGRESS has been made in the past few years in production and application of furnace atmospheres to prevent scaling and discoloration during the heat treatment of metals. Gas fuel is ideally suited to this purpose, as it not only supplies the heat for the process but also, either directly or through its combustion products, furnishes the furnace atmosphere. This present contribution was taken from the Report of the Non-Ferrous Metals Committee, RALPH D. HAWKINS, The Bridgeport Gas Light Co., Bridgeport, Conn., chairman. The report was presented before the Industrial Gas Section at the 21st Annual Convention of the American Gas Association, New York City, October 9-12, 1939.—(Abstract by GAS.)

As the brass and copper industry became more familiar with the use of controlled atmospheres, and as the gas equipment manufacturers learned more concerning the industry's problems, and the characteristics of copper and its alloys, it became apparent that equipment for bright annealing could be considerably simplified. The early furnaces were expensive in initial cost and, particularly the muffle furnaces, were limited in size. The operating cost on this type of equipment was also somewhat higher because the furnace efficiency itself was lower and because the heat generated in forming the atmosphere was wasted.

The cost of preparing the atmosphere led to investigations in two different lines. In one case the products of combustion used for heating the muffle itself were removed from the combustion chamber, purified, dried, and introduced back into the muffle as an atmosphere. This application was satisfactory from the standpoint of the surface condition of the product but did not eliminate the disadvantage that a muffle was still necessary and that its use limited the size of the equipment.

Direct Fired Burners

At about the same time recognition was given to the fact that water vapor in the atmosphere is not detrimental unless the temperature drops to a fairly low point, as is the case where work is slow cooled. There were occasions where it was not necessary to slow cool the work, but where the product could be quenched in a direct water spray. Several furnaces of this type were installed utilizing direct fired burners, the only departure from conventional furnace design being that the furnaces were constructed with a gas tight casing, with provisions for maintaining a positive furnace pressure at all times. The burners were set to maintain reducing conditions, the flue gases containing approximately one and one-half per cent carbon monoxide.

In order to eliminate the infiltration of air during periods of low turn down, it is necessary, in some cases, to supply a larger volume of atmosphere than is actually required to hold the furnace at temperature. In cases of this kind, steam supplies a ready source of volume atmosphere. Another means of accomplishing the same purpose is to circulate a portion of the products of combustion through an extraneous cooler, introducing cool gases back into the furnace to make up the necessary volume.

The larger of these direct fired units were originally constructed with direct quench, the temperature of the quench water being controlled so that any residual matter adhering to the product flashed off upon exit from the furnace. These furnaces were particularly adaptable to the annealing of tubing and rod where quantities of water would not be held by adhesion or capillary action of closely wound layers of material.

Since these furnaces worked so satisfactorily on applications made in conjunction with spray quenches, the industry soon turned to similar furnaces constructed to operate in conjunction with dry cooling chambers. In these furnaces, no change was made in the furnace construction itself, with the exception that a slow cooling chamber was added on the discharge end. Since it was impossible to utilize a wet atmosphere in the slow cooling chambers, the atmosphere for the cooling chamber was obtained by withdrawing a portion of the flue gases from the heating chamber, circulating them through a cooling and drying unit, and reintroducing them into the cooling chamber. This is necessary to prevent infiltration of moist products of combustion from the heating chamber into the cooling chamber. Such furnaces are being used satisfactorily for the annealing of coiled sheet and refrigerator tubing, as well as other products where water staining would be detrimental to the finished product.

Recently, a great deal of interest has

been aroused in the non-ferrous industry in connection with the use of convection heating with controlled atmospheres. These furnaces consist merely of a modification of the direct fired furnaces discussed above, in that the products of combustion developed in heating the furnace are also used as a protective atmosphere. The only difference in construction lies in the fact that the furnaces are equipped with recirculating fans which artificially create a high degree of recirculation in the heating chamber with a resulting increase in heating rates. In many cases, convection type furnaces have been simplified by burning all of the gas required for heating in small extraneous combustion chambers, recirculating the hot products of combustion by means of the recirculating fan. This method of heating has eliminated the multiplicity of burners generally common to direct fired furnaces, and has considerably simplified maintenance and control.

An Outstanding Development

One of the most outstanding recent developments is the continuous annealing of wire in open gas flames. This equipment consists of a long row of accurately controlled gas flames. The flames meet end to end, and the wire passes through dies which hold the wire in the exact portion of the flame necessary to obtain proper temperature and bright surface.

Wire is handled with this equipment at speeds up to 1500 ft. per minute. Most of the units built so far are for use on No. 6 (0.162 in.) to No. 16 (0.051 in.). Smaller units to handle wire as small as No. 36 (0.005 in.) are being made.

This equipment offers many advantages for the annealing of wire. It eliminates the necessity of any furnaces and permits straight line production with saving in gas fuel, better and more uniform anneal, cleaner surface, and reduction in labor and floor space.

This method of wire annealing is being tied in with the enameling operation and at various speeds, is used as an anneal-pickle-tin combination. In this operation, the pickling is accomplished by passing the wire through a chamber containing chlorine gas and other vapors which effect a very satisfactory cleaning and fluxing. From the pickle chamber, it passes into a cast iron tube into which molten tin, at a proper temperature, is pumped at a very low pressure. This method of producing tinned copper wire has been found to produce work with greater uniformity of coating and color.

The foregoing would indicate that the present trend in controlled atmosphere equipment in the non-ferrous industry lies along the lines of simplification of furnaces and the elimination of as much auxiliary equipment as possible. At the present time, it would seem that future installations would utilize the products of combustion from the heating burners as atmosphere. Except in special installations, it is unlikely that it will be necessary to provide atmosphere preparation units as auxiliary equipment.

Seeing That the New Home Is an All-Gas Home

• F. M. BANKS, vice president, Southern California Gas Co., Los Angeles, Calif., in a paper, "Following New Construction," delivered before the Commercial Section of the American Gas Association meeting in Annual Convention in New York City, October 9-12. Mr. Banks' paper was a portion of a symposium on "Gas in New Homes," other contributors to the symposium being J. P. LEINROTH, Public Service Electric & Gas Co., Newark, N. J., and H. VINTON POTTER, Oklahoma Natural Gas Co., Tulsa, Okla.—(Abstract by GAS.)

SOUTHERN California Gas Co. serves approximately 700,000 residential customers, largely in individual homes. At present there are more than 10,200 dwelling units in course of construction, which averages 340 units for each of the company's 30 field representatives to follow. Contact with the customer begins immediately upon receipt of information by advance notice, building permit notice or other source of information.

Each new job is recorded in duplicate on a form which, when completed, furnishes a running record of calls made, when made, whom interviewed, owner, architect, builder, etc., and lastly the equipment finally installed. One copy is the field card and the other is cardexed and watched for progress made, the office card being posted after each call. Doubtful jobs get special attention, but jobs reported as sure nevertheless receive on an average of four field calls, because we are never sure until the appliances have been installed and so reported.

First Call Important

The first call is most important. Representative states that he has called to check gas service requirements to determine if pipe sizes are adequate and correctly located. He inquires when the house will be started, states that he will work with the contractor so that the meter location opening will be proper and will cooperate so that the service line will be installed when digging will be least inconvenient. He then asks to see the plans, suggests a radio outlet, says something complimentary about the plan arrangement. This type of approach works and usually before the representative leaves, he has been through the old house, cataloged the appliances in use, and learned the occupants' intentions regarding the new home installation.

Each field and office record is advance-dated for second call as the salesman indicates. If doubtful, calls are made as often as deemed advisable. If customer indicates gas for all uses, the second call is made usually between 15 and 30 days after construction starts. The builder or boss carpenter is interviewed.

Our representatives solicit aid from the contractor and architect, most of whom now favor gas. They offer services of a representative of our Home Planning Bureau; present a booklet on how kitchens are planned, dealing with color, appliance arrangement, draperies and other home suggestions.

What we term normal jobs average four calls, the last being the call after occupancy to service appliances. At this time a complete inventory is taken and recorded. This completes the efforts of the new construction representative. If old or obsolete appliances have been moved in, leads are forwarded to the sales department.

Doubtful jobs require more contacts.

Well over 90 per cent of new homes are equipped with gas ranges; over 90 per cent with gas water heaters; about 91 per cent with gas space heating; 80 per cent are equipped with mechanical refrigeration, of which 19.4 per cent are gas. New gas refrigerators are used 38.3 per cent as often as new electrics, but in some areas new gas refrigerators actually exceed all new electrics.

■ ■

Ten-Mile Line Built in La.

Arkansas-Louisiana Gas Co., Shreveport, La., is laying a 10-mi., 14-in. feeder line from the Bistineau field of Bienville Parish, to its trunk line near the Dubberly field. Work has also been begun on a 40,000,000 cu. ft. high pressure absorption plant in the Bisteneau field.

Champion Spark Plug Co. to Install New Gas-Fired Continuous Decorating Kiln

By HARRY W. SMITH, JR.
Director of Industrial Publicity, A. G. A.

CHAMPION Spark Plug Co., Ceramic Division, Detroit, world's largest producer of insulators for all manner and sizes of spark plugs, has placed in operation this Fall a new continuous decorating kiln expected to result in (1) more flexible charging as to variety of sizes; (2) considerable savings in fuel and labor; (3) greater output capacity; (4) smoother production, and (5) fewer rejections, in the operation of permanently decorating each highly glazed sillimanite insulator with the familiar Champion Co. name, trade mark, and model number. The unit will be of the muffle or tunnel type, both over-and-under-fired by radiant tubes fueled with Detroit city natural gas for eight months of the year and with butane for the remaining four. It will replace seven electrically fired nickel-tube kilns developed years ago by the company and used continuously since—but outmoded by recent advances in fueling and furnace engineering.

In the old equipment the glazed insulators (the glost having been fired with the bisque in one of the famous 305-ft. long Dressler Kilns built in 1918 and 1929) are fed with their freshly printed brownish-red decoration into parallel pure nickel tubes of internal diameters slightly larger than the insulators themselves. Through the tubes and end-to-end, they are thus inched along the heat zone to be expelled upon inspection tables. Difficulties lie in occasional clogging of the nickel tubes, and in the fact that, in order to run different sizes of insulators push-through or positioning blocks must be fed alternately with the smaller sizes of insulators to prevent buckling of the line. This means reduced capacity and lost heat. Speed and economy are further limited by the out-dated means of heat engineering and by a high labor cost per unit of output.

Dimensions

The new decorating unit will be approximately 60 ft. long, 4 to 5 ft. wide, 4 to 5 ft. high, and will enclose a furnace length tunnel approximately 1 ft. x 2 ft. in section. It will operate at 1400° F. and handle 300,000 insulators of assorted sizes per day. One 8-hour shift will handle the complete day's production, the fuel input being reduced during the remaining 16-hour period so as to maintain holding temperatures without load.

"The savings in overhead, by concentrating labor, light and supervision into a single 8-hour shift," says Frank H. Riddle, director of Research, "will more than compensate for the cost of fuel for holding purposes. Surprisingly little fuel will be necessary for the job, very thorough insulation being a tremendous help."

One of the important economies of the new continuous kiln will be that it will utilize for the actual decorating job heat which would otherwise (as in the experimental units) be lost in the containers, trays, or racks carrying the insulators through the kiln.

The new kiln has not been designed solely "on paper." For the past 10 months, several million spark plug insulators have been decorated in one of two experimental or "pilot" kilns, similar in design and firing to the planned giant, but of much smaller capacity. Much has been learned from their operation as partial production units, and they have fully justified the construction of the larger unit. Nor will the investment in these smaller furnaces be lost or charged wholly to research. After the new kiln has been put into operation, the two experimental kilns will both be adapted (one already having been so converted) to regular low temperature glazing schedules for that fraction of the Champion insulator production on which glost is fired separately from bisque or body.

The construction of the "pilot" decorating kiln currently being used,

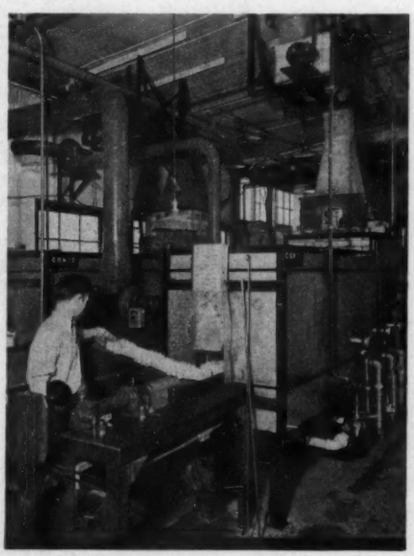
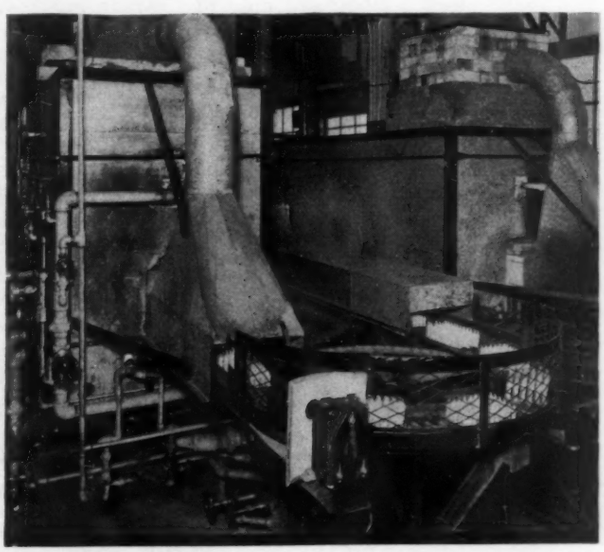


FIG. 1 (at left) Front view of "pilot" decorating kiln, showing where some of the muffle air flows out and upward from the inlet end of the muffle through sheet metal ducting.

FIG. 2 (at right) Rear view of kiln. Most of the muffle air is exhausted at the rear end of the kiln by natural draft into the main flue.



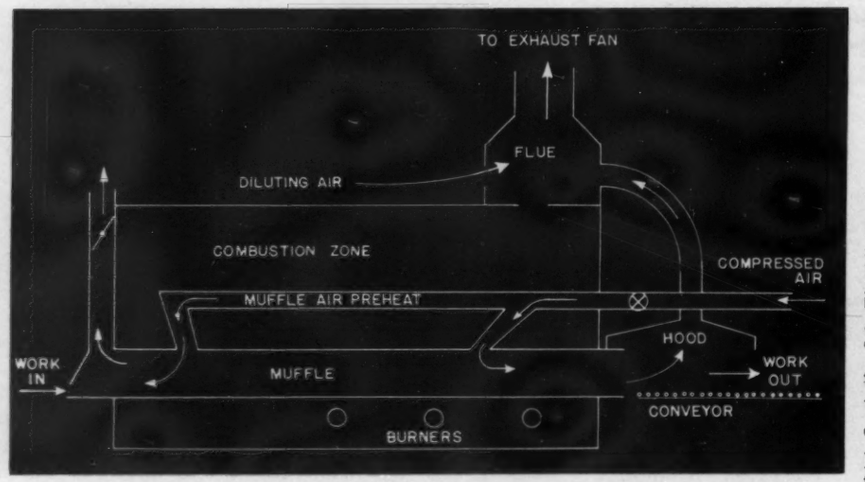


FIG. 3. Schematic vertical longitudinal section of pilot kiln showing method of oxidizing atmosphere protection.

and the manner of its charging, etc., are revealed in the front (Fig. 1) and rear (Fig. 2) views photographed. The unit is 17 ft. long, built of insulating firebrick and 1 in. of asbestos, and jacketed in galvanized sheet iron. The muffle is of sillimanite refractory, is 5¾ in. square, extends through the furnace, and is supplied at two points with a constant flow of hot air (as shown in Fig. 3) tapped from the 80-lb. compressed air line which runs throughout the plant.

It is highly important that oxidizing conditions be maintained within the muffle so that the decoration does not reduce or fade. A positive air pressure, of 3 in. equivalent water column is maintained in the muffle, the air having been preheated to the muffle temperature in the conduit through the combustion chamber by means of which it is conducted to the two inlets in the top of the muffle. Some of the muffle air flows out and upward from the inlet end of the muffle through sheet metal ducting (Fig. 1). but most of it is exhausted at the rear end of the kiln by natural draft into the main flue (Fig. 2).

Water-Cooled Burners

Firing is from three water-cooled gas burners under the muffle at the side near the outlet end. Low pressure air inspirates city pressure gas into an automatic proportioning device located under the furnace, and the correct gas-air mixture is manifolded to the individual burners. Pilot ignition and over-night temperature holding is provided by one flame retention nozzle firing along in front of the main burners from the outlet end (Fig. 2). The four burners consume 1241 cu. ft. of gas per hour during decoration; and the pilot burner alone consumes 55 cu. ft. per hour during holding periods.

Three thermocouples are permanently installed to check muffle temperatures along the furnace length, the controller and recorder being always connected to the hottest of the three. At first this is the No. 1 couple in the center of the muffle, but as ware begins to pass through the kiln, the maximum temperature point shifts progressively to the No. 2 and No. 3 positions within 45 minutes.

The draft on the furnace is regulated by partially bricking up the three side openings in the expanded flue hood on top of the furnace. Also by means of these openings enough cool room air is mixed in with the hot flue gases to reduce the temperature of the gases which must be handled by the exhaust fan. Only because the kiln is experimental, and extreme (and often abnormal) firing conditions must be established for test purposes, need such provisions be made.

A temperature of 1850° F. is maintained in the muffle, and 3000° F. is general in the combustion chamber. The decoration fires at 1400° F., but insulators pass through the kiln so rapidly that the 1850° F. muffle temperature develops only 1400° F. on the work. Obviously such "pushed" operation is not the most efficient, but tests must be made under all conditions to determine the interrelations of the many economic and production facts involved—the unit being but a "pilot" for the final huge kiln.

As for the actual work temperature attained, this is most critical. A variation of 25° F. one way or the other will result in either under-firing (decoration will rub off) or over-firing (decoration will fade out).

Hydraulic Pusher

The method of charging is noteworthy. Some 38 to 54 freshly imprinted insulators, depending on their size, are dropped onto vertical pins bristling a metal tray—the whole being of high-nickel-high-chromium steel designed to resist high temperatures. The trays are conveyed to the operator who places them on a ramp from which one tray at a time is pushed endwise into the muffle by a hydraulic pusher (Fig. 1). The complete end-to-end line of 18 trays extending through the muffle progresses one tray length every 27 seconds. A beam of light is focussed along the tunnel, and received in a photoelectric unit at the outlet end (Fig. 2), so that, if the line of trays buckles, the pusher circuit is broken, the movement is stopped, and the operator is warned to clear the muffle manually or otherwise correct the error before operation can be restored. It takes 8 to 9 minutes for a tray of insulators to travel the length of the furnace.

On leaving the furnace, the trays are pushed from the muffle onto a horizontal traveling conveyor (Fig. 2) on which they are U-turned and passed back through a cooler consisting of a sheet metal housing top-fed with air pulled in from the outside by a blower. The complete decorating operation takes 20 minutes.

Spark plug insulators of all sizes must be decorated. Therefore, trays filled with one size are alternated with others—but in accordance with a fixed sequence or "pattern" worked out so as to keep an even insulator load in the muffle at all times. Otherwise the smaller cores would be overfired and the larger ones under-fired at the same heat input to the kiln.

■ ■

Citizens Gas & Coke Extend Mains to Williams Creek

The Citizens Gas & Coke Utility, Indianapolis, Ind., has begun work on the extension of its gas mains to Williams Creek, following the action of that town's trustees in granting authority for such extension.

When the present work is completed there will be 855,000 feet of mains in the Williams Creek section.

■ ■

Gas Office Remodeled

The Natural Gas Co. of West Virginia, Sebring, Ohio, is remodeling its office building to provide more space for offices and displays. The work is being done by the company's maintenance force.

Walter Thompson, Reliance Regulator President, Dies

WALTER M. THOMPSON, president of the Reliance Regulator Corp., of Alhambra, Calif., and for many years a prominent leader in the gas industry, passed away November 20 at his home in Pasadena, Calif. He was 76 years of age.

W. M. THOMPSON

Mr. Thompson was born in Dundee, Ill., and his father built and owned the Elgin Gas Works, Elgin, Ill., and it was there at the age of 10 that he gained his first experience in the gas industry. Mr. Thompson came to Southern California in 1911, and in 1917 founded the Reliance Regulator & Manufacturing Co. in Pasadena. In 1931 this firm together with the Reliance Iron Works, which was headed by his son, Arthur C. Thompson, became affiliated with the American Meter Co. of New York City, Mr. Thompson retaining his post as president of the Reliance Regulator concern.

For the past 20 years Mr. Thompson had been active in the Pacific Coast Gas Association, having served several of those years as a director of that body.

■ ■

New England Association Holds Division Meetings

Three divisions of the New England Gas Association held meetings November 16 and 17 to hear several well-known speakers and discuss division problems. The accounting division met in Providence, R. I., featuring Paul N. Kistler, associate professor of engineering, Brown University, who described his Service Manual for the New England Gas Industry.

The industrial division met at Fitchburg, Mass., the program including a description of the Simonds Saw and Steel Co. plant in which practically all of the heat treating operations are conducted with gas.

The sales division convened at Hartford, Conn., with Hugh A. Mitchell, McCann, Erickson, Inc., as the featured speaker.

■ ■

New Office Opened at Yreka By Coast Counties Co.

A new office for the Coast Counties Gas and Electric Co. has recently been opened at Yreka, Calif. The new building has been under construction since last summer, when the old offices were destroyed by fire.

In addition to the business office and display floor, the new quarters have an apartment in the rear for the local representative of the company, Erle A. Byer. Gas equipment has been used throughout for heating, hot water and cooking.

■ ■

Pennsylvania Gas Field Produces Large Well

A new record-breaking gas well, producing between 40,000,000 and 60,000,000 cu. ft. daily, was drilled recently in the new Sharon township field in Potter County, Pa., by the Empire Producing Co.

Another new well in Sharon Township, the N. Kemp well, increased its production to 26,000,000 cu. ft. of gas per day after it was drilled deeper. When first drilled, it produced only 2,000,000 cu. ft.

FPC Prescribes Uniform Accounts for Utilities

EFFECTIVE January 1, 1940, a uniform system of accounts will be prescribed for natural gas companies, subject to the provisions of the Natural Gas Act, according to a ruling adopted Nov. 3 by the Federal Power Commission. Under the Natural Gas Act the Commission is authorized to make such ruling.

The plans for uniform accounting were sent to state commissions, natural gas companies and other organizations May 15, 1939, and on Sept. 27 and 28 a hearing on the subject was held, at which representatives of the A.G.A. and natural gas companies filed documentary evidence and briefs.

The new uniform system of accounts will require the original cost of natural gas plants constructed or acquired to be stated in the accounts within two years from the effective date of the system, classified first under general groups, such as production, transmission, distribution, and general, and further classified under each group by specific accounts having appropriate titles descriptive of the property. The difference between the original cost and the cost to the utility, or the book cost must be carried to an adjustment account. Property and plant accounts of each natural gas company are therefore to be stated on the uniform basis heretofore established in the electric industry, that of original cost to the person first dedicating the property to public service, and as a basis for accounting for depletion, depreciation and retirements.

Depletion is to be accounted for monthly with a pool of gas constituting a unit for purposes of computing such costs. Depreciation is to be accounted for monthly and functionalized to show the estimated amount of depreciation accrued to each functional group of natural gas plant accounts. Retirement units of property, the cost of replacement of which shall not be charged to maintenance, have been prescribed. Provision is also made for accounting for operating expenses, rents, and other charges against the operating revenues by functional groups so far as practicable, with a view to minimizing arbitrary allocations of charges in determining the cost of production and transmission as required by the Natural Gas Act.

■ ■

Philadelphia Co. Conducts Cooking School Series

The Philadelphia Gas Works Co., Philadelphia, Pa., will soon complete an eight-week series of all-gas cooking schools held at five of its branches—Frankford, North Philadelphia, South Philadelphia, West Philadelphia and Germantown. The free schools are being conducted in cooperation with local newspapers, and are under the direction of Beatrice Cole Wagner, home service director.

■ ■

East Ohio Co. Plans Line

Construction of a six-mile pipe line is being contemplated by the East Ohio Gas Co., Cleveland, Ohio, to serve gas to a new plant recently constructed by the Copperweld Steel Co. of Glassport, Pa. It is estimated the new pipe line will cost between $50,000 and $60,000.

The modern and streamlined all-gas store recently opened by the Public Service Co. of Northern Illinois on Lake Street, Oak Park. The new gas appliance store has the first gas-fired air conditioning system installed in the Chicago metropolitan area.

SALES Slants

How to Raise Objections and Sign Up a Prospect

• **With the article appearing on this page, the sales series which began in the issue of GAS for June, 1939, is brought to a close. As previously stated, these articles were not intended as a course of study, nor did they aim to teach a new system of selling. Rather, it was their purpose to present directly and unacademically a few fundamental principles of the art of salesmanship. It is hoped they have accomplished at least some of that purpose.—Editor.**

IT IS fortunate that the terminology of salesmanship has fixed upon the word "objections" to describe questions the prospect raises about a product. In some cases, true enough, the word is used accurately; there are prospects who "object." But more often than not, an objection becomes, on analysis, a mere question in the mind of the prospect. Usually it means he lacks some piece of information which, once supplied, clears up the lurking doubts in his mind and leads to a sale.

Seen in this light, objections are not the bothersome and even malignant things some salesmen believe them to be. As a matter of fact they can be taken as sure indications of the prospect's state of mind. And handled properly, they can be used to accomplish the very thing they seem to prevent: bring your proposition to a successful close.

In Chapter 6, we were analyzing the hypothetical case of a Mrs. Prospect whom you are endeavoring to interest in a six burner CP range. She has expressed admiration for a model you pointed out to her, which has given you an opportunity to inquire into the size of her family, the family's eating habits, the size and make of her present range, and other data of this sort. This information you form into a kind of "case history" of Mrs. Prospect and her family.

Now let us suppose you have determined on the basis of her answers to your questions that her cooking problems would best be solved by just such a range as you are now demonstrating. Thus far she has not committed herself in one way or another, except to say she is "just looking around." And so it is up to you to frame a question or make a statement from which you may secure some idea of how close she is to a buying frame of mind. In other words, it's up to you to seek out an objection deliberately just as a sample.

Much depends on how you go about this. The wrong question might end the sales presentation right there. The correct one will give you something to work on and keep the interview alive. A question which is sure to elicit a fruitful answer might be phrased something like this:

"Is this range about the size and price you had in mind, madame?"

No matter what her answer she is bound to disclose whether or not she is anywhere near a buying decision. She might reply that it was too large, that it was too expensive, or that it didn't have as large an oven as she liked. Or she might simply say she wasn't really in the market for a gas range just now. The latter answer would give you a perfect lead. You would know that she does not fully realize her need for a new gas range. You know you must assist her to reach a need decision before you can come to an agreement.

"Well," you might say, "you need a new gas range, don't you, Mrs. Prospect?"

Suppose she replies, "Yes, I need one I suppose, but we just can't afford to get a new one now."

Now you have a real objection with which to work: "I can't afford it." If you know modern gas ranges and are any kind of a salesman at all, you should be able to dispose of that objection in short order purely on the basis of economy of ownership.

Remember, Mrs. Prospect has three buying decisions to make before she can make the final decision to buy. Do I need it? Have I the money? Should I buy now? Those are the three questions she must answer affirmatively before she is ready to sign on the dotted line. Now she has admitted her need, and you have convinced her she can really not afford not to buy. But she still hesitates. What does that indicate? It indicates that she has not yet reached the decision to buy now.

Back in Chapter 5 we stated that it was possible to plan a sales demonstration that would be effective and at the same time elastic enough to adjust itself smoothly to each individual case. We pointed out that an understanding of the three decisions a buyer must make before he buys anything is important because it affords a basis upon which the salesman may plan his sales talk, and we set out to show how this operates by the example of Mrs. Prospect.

Now we have brought Mrs. Prospect down to a point where she is ready to buy, but not now. You have proved that by checking the progress of the interview against the three decisions. Your interview is going according to plan, and it should not be necessary to elaborate this particular case further.

But let us see if we cannot reduce the points we have made to a summary and develop a workable plan that may be followed in any interview. You meet the prospect for the first time. You determine that she is in the market for your product and you develop a "case history" of her family to determine her requirements. You show her your product and find out what questions are in her mind. This gives you a clue to the decision she has not yet made. You answer her objections and dispose of them to her satisfaction. And then you do what? You ask her to buy.

It should be just as simple as that. Yet that final step is the one many salesmen never learn. And it always seems to be the one that is most difficult to master. But why should it be? You've told your story. The prospect has agreed with you point after point. She is ready to buy. She can't very well ask for a contract. It is up to you to hand her one and ask her to sign.

There are dozens of ways to bring a sales presentation to an easy close. We could write a whole book on that subject alone. The best way is the way that is most natural for you. There is one good rule, however, that must be followed: ask your prospect to buy early and often. Why hesitate? If the prospect is not yet ready to sign a contract, she will say so. She expects

you to want her order and to ask for it. She doesn't think you are showing her an appliance just for the fun of it. If she gives you an opening, why not say right out, "Just step into the office and we'll draw up a contract." Suppose she replies, "Oh, my goodness, we can't afford it!" What does that mean? It means you still have a selling job to do.

The close, as a matter of fact, should be a natural and logical conclusion to a well organized sales effort. If you have been thorough in appealing to the prospect's buying motives; if you've licked the three buying decisions; if you have overcome the questions and objections in the prospect's mind;—if you have done these things, then there is no reason why your prospect shouldn't be ready to buy, nor why you should not ask her to.

These are a few of the fundamentals of selling. We have tried to touch upon those which should be most valuable both to the beginner and to those who have been in the game long enough perhaps to forget a few of the things they learned at the start. "The modern salesman," we said in our first chapter, "has many functions. The least important of these is to sell something to someone. It is his job to analyze human needs, and to supply the thing that will satisfy those needs adequately. It is his job to create in the minds of his clients an appreciation of the benefits they will secure from the possession of the goods he handles . . . such is the proper frame of mind for the salesman." If we have failed to put over a single other fundamental, we hope that one at least will be remembered.

■ ■

CP Ranger Club Receives Ten Thousand Registrations

Total registration in the CP Ranger Club, sponsored by the A.G.A. for gas company and dealer salesmen, has reached 10,468, representing 31 states. The registrants become full-fledged "Rangers" when they sell 25 CP ranges during the calendar year. The next rank is "Star Ranger," which is awarded for the sale of 50 ranges during the year; then "Royal Ranger" and "Royal Star Ranger," the latter two ranks being earned in the fourth consecutive year of qualification for either of the first two titles.

■ ■

"Home Comfort Campaign"

An advertising program which is called the "Home Comfort Campaign" has been opened in Weatherford, Okla., by the Consolidated Gas Utilities Corp., according to E. M. Holcomb, local manager.

Eight local retail firms, selling gas appliances, are cooperating, not only in the campaign itself, but to the end that greater efficiency and economy may be effected for gas users by this merging of efforts.

Gas Men's Quizz Features New Jersey Meetings

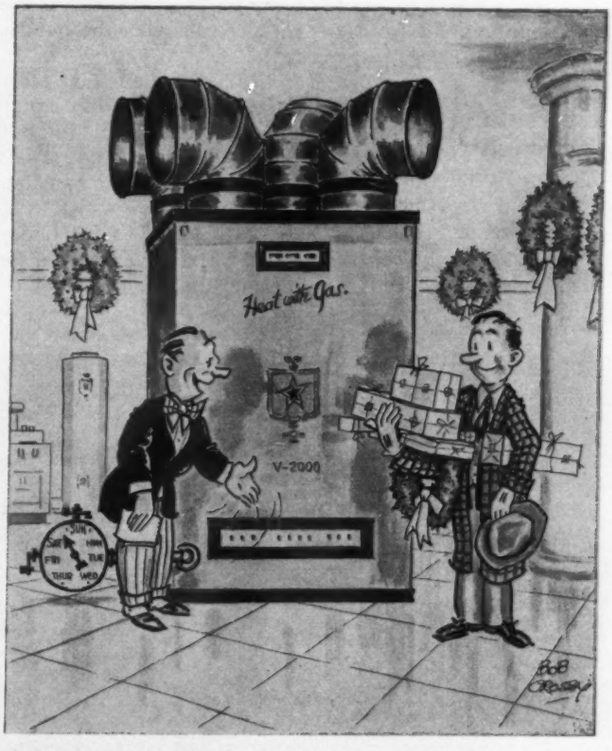
OVER 2700 employes of 10 New Jersey gas utility companies attended at least one of five annual New Jersey Gas Association get-togethers in Newark, Hackensack, Camden, Ocean City and Allenhurst, Oct. 24, Oct. 27, Nov. 1, Nov. 2, and Nov. 9, respectively. And at each location competitive teams were selected from the audience and plied with "sticker" questions drawn from a hat loaded with 200 best gas - industry - slanted questions submitted in a state-wide contest previously conducted by the Association. Prizes in hard cash repaid the contestants.

Credit for the success of the quizz feature of the New Jersey regional meetings should go not only to the contestants and the instructive, amusing, and practical questions themselves, but to the masters of ceremonies, each a well-known gas industry leader in the area served by the meeting.

Preceding the questions-and-answers phase at each meeting was the formal business program, which in each case consisted of words of greeting from George B. Webber, director of Educational Work, Public Service Electric and Gas Co., Newark, and 1939 president of the Association, followed by introductions of Frank H. Darlington, Peoples Gas Co., vice president, and Harry A. Sutton, Public Service Electric & Gas Co., secretary of the Association, and by the single featured speaker, Harry W. Smith, Jr., director of Industrial Publicity, American Gas Association, New York. Mr. Smith's presentation covered "GAS—In the 'World of Tomorrow'" with statistics showing the job done by gas at the New York World's Fair.

Especial credit for a notable success in regional association functions is deserved by Association Vice President Darlington, who acted as chairman of the general Regional Meetings Committee and his staff.

DOTTED LINE ROSCOE



". . . and picture the look on the little lady's face when she finds our Triple Blast-Super Double Air Model V waiting for her under the Christmas tree."

Butane-Air Does Standby Service at Colusa, Calif.

• **HARRY J. SMITH, Pacific Gas and Electric Co., San Francisco, Calif., and JOHN K. HELLER, Gasair Corp., San Francisco, in a paper, "A Butane-Air Gas Standby Plant for Colusa, Calif.," prepared and presented for the Pacific Coast Gas Association. During recent times the use of liquefied petroleum gases for standby purposes to relieve natural gas systems during periods of stress has gained increasing importance. Several such standby plants have been described in GAS, the most recent contribution on this topic being that made by A. F. BRIDGE and F. A. HOUGH of Southern Counties Gas Co., Los Angeles, in GAS, May, 1939, p. 48.—(Abstract by GAS.)**

THE butane-air gas plant at Colusa, Calif., was placed in operation for standby service on June 8, 1939. This installation insures the town of Colusa, with 642 consumers, a continuous supply of gas should a failure occur to the natural gas transmission line.

The natural gas supply, from the Buttes fields, has a heating value of 1015 B.t.u. per cu. ft. and a specific gravity of 0.554, being 100 per cent methane. The composition and properties of the butane vapor are given in the table on the chart, Fig. 3.

The butane-air gas standby plant has an hourly capacity of 5000 cu. ft. with two tubes in operation, or a daily capacity of 120,000 cu. ft., and this capacity was obtained from low pressure holder measurement during the time of the test. The expected peak day for the next winter (1939-1940) for natural gas is estimated at 140,000 cu. ft., and should butane-air gas be required, approximately 108,000 cu. ft. will be necessary to satisfy the demand. The reason for this reduction in demand is that it requires 1300 B.t.u. per cu. ft. of butane-air gas to perform satisfactorily in the same appliance now using natural gas of 1015 B.t.u. per cu. ft.

Fig. 1 shows the internal parts of the gas-air mixer with the two venturi mixing tubes located at the bottom of the unit.

The general view, Fig. 2, shows the butane tank installation, gas-air mixer and direct fired vaporizer, as well as a portion of the low pressure holder. The 6000-gal. butane tank will run the gas-air at full load for approximately 90 hours. The reason for installing only one butane tank is that, should an interruption to the transmission line continue over a long duration, deliveries of butane can be made by tank truck, as distributing stations are available in this vicinity. On top of the butane tank can be seen the assembly of three 3-in. safety valves with a 3-in., 4-way, 3-port shut-off valve that will always have two ports open so that two safety valves will be in operation at all times. With this arrangement, repairs to the safety valves can be made without removing the butane from the tank.

In the end of the butane tank is located the butane supply line, equalizing line, pressure gage, drain line, 10 per cent line, and rotary gage. This is all installed in a circular housing with double swing doors so as to keep unauthorized persons from tampering with the valves, and it is also a very convenient location for operation.

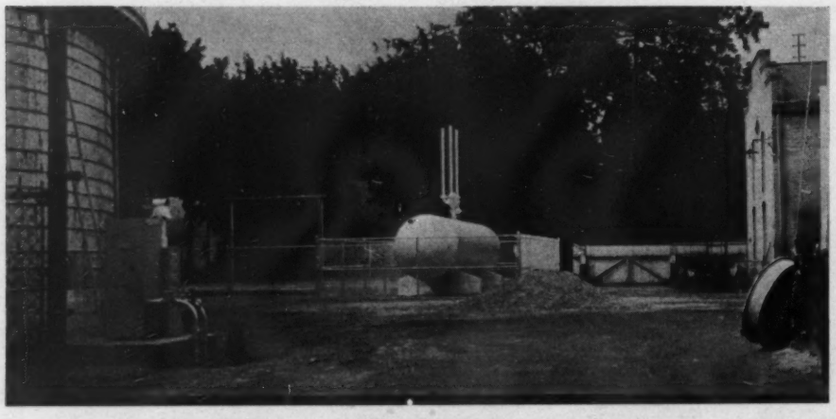


FIG. 2. General view of the butane-air gas plant showing butane storage in background and gas-air mixer and direct-fired vaporizer against holder on the left.

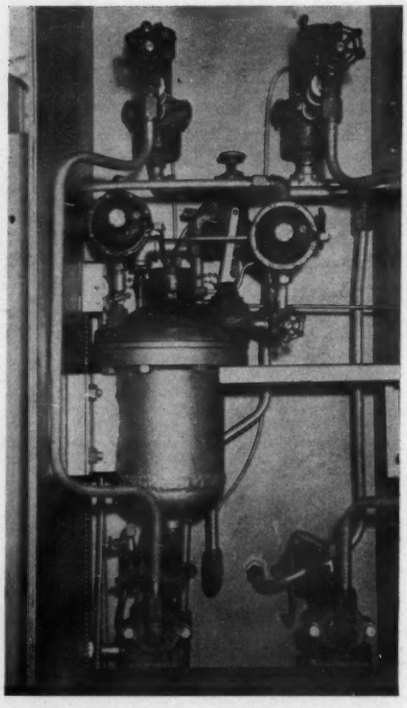


FIG. 1. Interior view of Gasair mixer.

The equipment required for the distribution of natural gas is a high pressure holder, meter, and high and low pressure regulators. Equipment for the butane-air gas is a butane storage tank, low pressure holder, gas-air mixer, vaporizer, compressor, low pressure booster, and a low pressure regulator for maintaining the desired low pressure to the distribution system. The high pressure regulator used for the natural gas would also be used for maintaining the desired pressure to the high pressure system.

The high pressure holder is connected at the delivery end of the natural gas transmission line and operates at a maximum pressure of 50 lb. gage. From this holder the gas is delivered to the distribution system through high and low pressure regulators. The high pressure system requires 7 lb. gage pressure and the low pressure system 7 in. of water column. The low pressure regulator at the outlet of the booster is installed to reduce the pressure developed by the booster to the distribution pressure. With the booster operating on natural gas, the static pressure is 10 in. water column, and with butane-air gas the pressure would be approximately 21 in. with a specific gravity of 1.4.

Because of the possibility of using this equipment in the future at other locations, tests were run to determine the maximum delivery pressures for each size of nozzle for various butane-air mixtures.

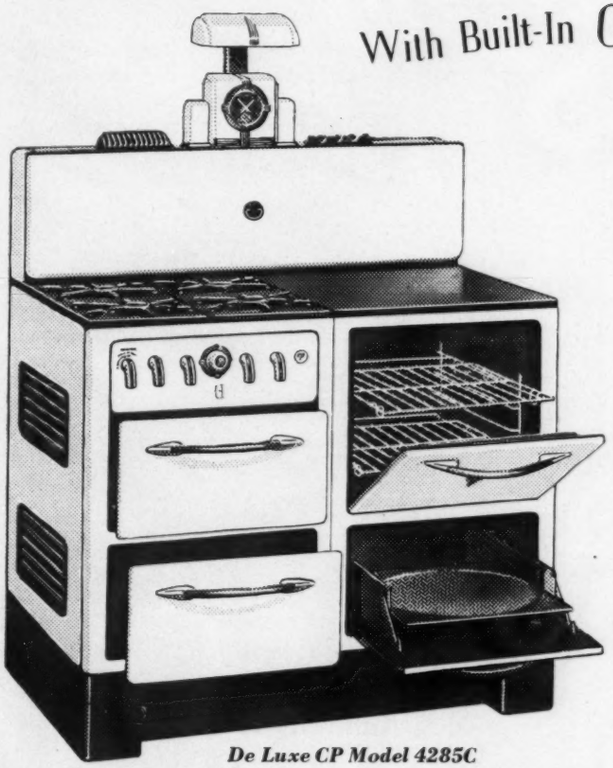
New DISTINCTIVE

★

WEDGEWOOD

★ *Gas Ranges*

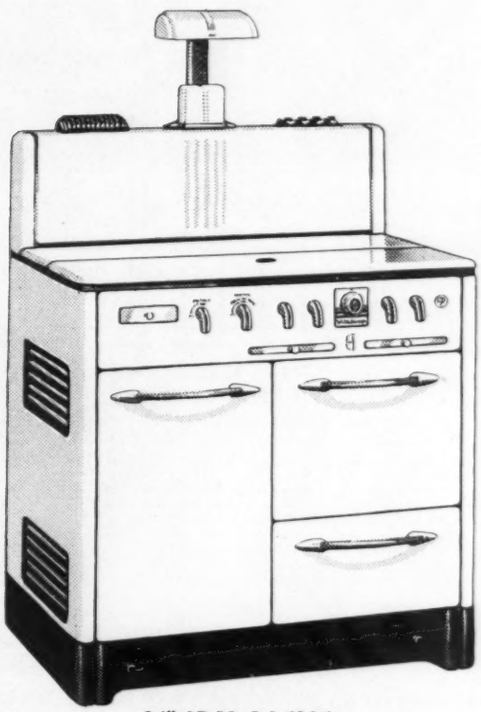
With Built-In GAS CIRCULATING HEATER



De Luxe CP Model 4285C

WITH HIGH SPEED - LOW TEMPERATURE OVEN
Instant, cheering warmth is the keynote of this lovely new De Luxe Wedgewood Range. The Built-in Gas Circulating Heater lights itself at the simple turn of the valve. Kitchen and breakfast room are heated quickly and economically.

FEATURES . . . FOR EFFICIENCY AND ECONOMY
• Three standard Speed-Plus-Simmer Burners. • One Giant Speed-Plus-Simmer Burner. • Astogril Rotor-Disc Broiler. • Oven Heat Control. • Stop-Catch Flat Bar Oven Racks. • Removable Oven Side Brackets. • Sectional Speed Top. • High-Speed, Low-Temperature Oven. • All Burners Self-Lighting.



36" CP Model 5285

WITH TOP GRIDDLE AND WARMER
This delightful Wedgewood Gas Range strikes a new tempo in efficiency, economy and beauty. Built-in Gas Circulating Heater is self-lighting and provides instant, clean, healthful warmth at low fuel cost.

Wedgewood Ranges Are Adapted for All Types of Gas Including Bottled Gas

Gas THE MODERN FUEL

ALWAYS WEDGEWOOD QUALITY—MAKES FRIENDS FOR GAS
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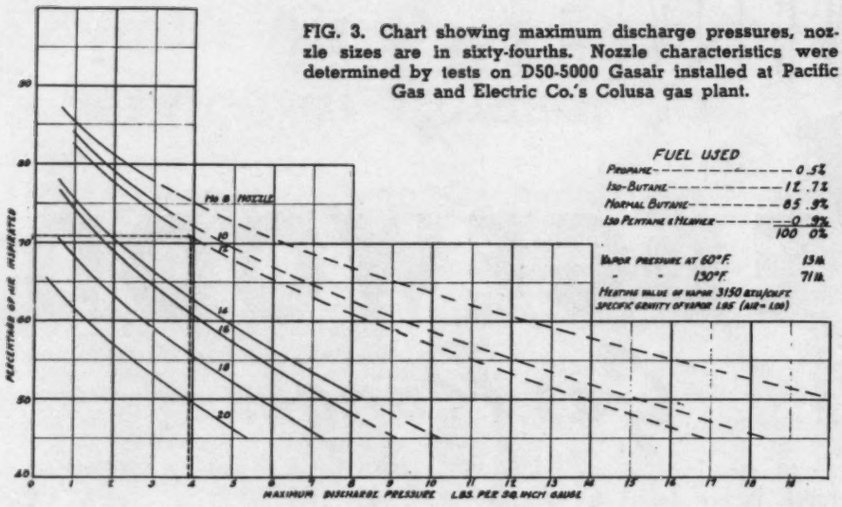

FUEL USED
Propane 0.5%
Iso-Butane 12 .7%
Normal Butane 85 .9%
Iso Pentane & Heavier 0 .9%
100 0%
Vapor pressure at 60°F. 13 lb.
" " 130°F. 71 lb.
Heating value of vapor 3150 BTU/cu.ft.
Specific gravity of vapor 1.85 (air=1.00)
No 8 nozzle
Percentage of air inspirated
Maximum discharge pressure lbs. per sq. inch gauge

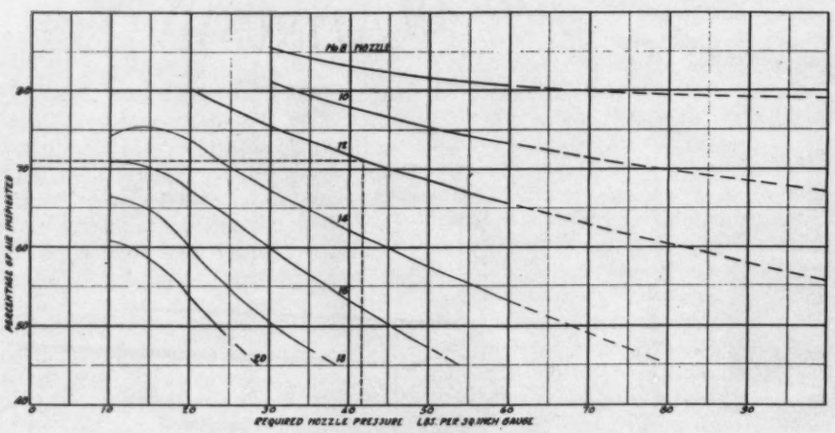


FIG. 3. Chart showing maximum discharge pressures, nozzle sizes are in sixty-fourths. Nozzle characteristics were determined by tests on D50-5000 Gasair installed at Pacific Gas and Electric Co.'s Colusa gas plant.

FIG. 4. Chart giving required nozzle pressures.

HOW TO USE THE CHARTS, FIGS. 3 AND 4

1. Determine the percentage of air required to be inspirated to give desired B.t.u. value, by dividing the desired B. t. u. value by the B. t. u. value of the undiluted vapor and subtracting the result from 100%. For example, desired 880 B. t. u. 880 ÷ 3150 = 28%, 100%-28% = 72%.

2. On chart No. 1 run across the required percentage line to intersect one of the nozzle curves. Dropping down to the horizontal scale, read the maximum back or discharge pressure. An example is shown as 71% to be inspirated, intersecting the No. 12 nozzle curve at 3.9 lbs.

3. On chart No. 2 run across the required percentage line to intersect the same nozzle curve as in chart No. 1. Dropping down to the horizontal scale, read the required nozzle pressure. The example shows as 71% to be inspirated and requiring 42 lbs. The complete answer, then, is that 71% air can be inspirated with 42 lbs. nozzle pressure and discharged against 3.9 lbs. with No. 12 nozzle.

The venturi mixing tubes in this unit have ½-in. diameter throats and tests were run on seven different nozzle sizes ranging from 1/8-in. to 5/16-in. in diameter, and charts, Figs. 3 and 4, show the results of these tests. It will be noted on the chart, Fig. 3, that there is a rather wide space between nozzles Nos. 12 and 14. This appears to be due to the fact that all the nozzles except these two were reamed. In all probability, the No. 12 curve would drop down and the No. 14 would rise if reamed nozzles had been used. An interesting point to note on the chart, Fig. 4, is that the curves reverse at around 15 lb. gage pressure. This, of course, is on account of the change in flow characteristics at the critical point near this pressure.

In order to produce the 1300 B.t.u. necessary for a substitute for Buttes natural gas, it required a 5/16-in. diameter nozzle. The per cent of air necessary for this B.t.u. is 58, and this was determined by analyzing for oxygen with an Orsat. Using this percentage of air and by ruling a horizontal line on Fig. 3 from this per cent of air inspirated to the No. 20 nozzle curve, and by following a vertical line down from this point on the curve to the horizontal scale, the maximum discharge pressure will give 1.5 lb. gage. Any discharge pressure on this 58 per cent line from 0 lb. to 1.5 lb. gage will produce practically the same B.t.u., provided the nozzle is maintained at 15 lb. gage, as is shown by Fig. 4, using the same percentage of air inspirated.

The reason for using a low nozzle pressure for the Colusa plant is that the butane-air gas is made direct into the low pressure holder at a continuous rate and in the winter when temperatures are low, the butane tank can be repressured with gas from the high pressure storage holder or from the discharge of the compressor when the butane plant is in operation. When this is required the compressor will be operated at a discharge pressure sufficient to produce 15 lb. gage nozzle pressure. If it is desired to make direct to a high pressure system with the same B.t.u., a maximum pressure of 9 lb. gage can be obtained with a No. 12 nozzle which would require a nozzle pressure of 87 lb. gage. This will also produce approximately the same B.t.u. from 0 lb. to 9 lb. gage, but a nozzle pressure of 87 lb. gage must be maintained through the complete range. Percentage mixtures and discharge pressures for regions between the curves can be obtained by reaming the smaller nozzle or adjusting the air shutter.

■ ■

Pipe Lines Proposed Across Two Louisiana Rivers

Two natural gas companies have recently applied to the United States Engineer's office in Vicksburg, Miss., for permission to build pipe lines across Louisiana rivers.

The United Carbon Co., Monroe, La., seeks to construct a 10-in. natural gas pipe line in and across Bayou Bartholomew, six miles north of Sterlington and approximately four miles above the mouth of the bayou. According to plans submitted, the line would be buried at least 2 ft. in the stream's banks.

The Memphis (Tenn.) Natural Gas Co., through the Monroe firm, Huey & Cage, has proposed building a 1-in. gas pipe line across the Ouachita River at Sterlington, 200 miles above the mouth of the Black River. The line would pass over a levee and be buried 3 ft. in the banks of the stream.

■ ■

Six Ohio Companies Seek Authority to Merge

Six Ohio companies have recently applied to the State Utilities Commission for permission to merge into one firm to be known as the Ohio Electric and Gas Co. The companies contemplating the merger are the Portsmouth Gas Co., Portsmouth; the Ohio Midland Light and Power Co., Canal Winchester; the General Utilities Co. and Ohio Northern Public Service Co., both of Bowling Green; the New London Light and Power Co., New London, and the Western Reserve Power and Light Co., Lodi.

The companies' petition states that although no rate reductions can be promised immediately, it will be the new company's policy to allow the consumers to participate in any savings accumulated.

■ ■

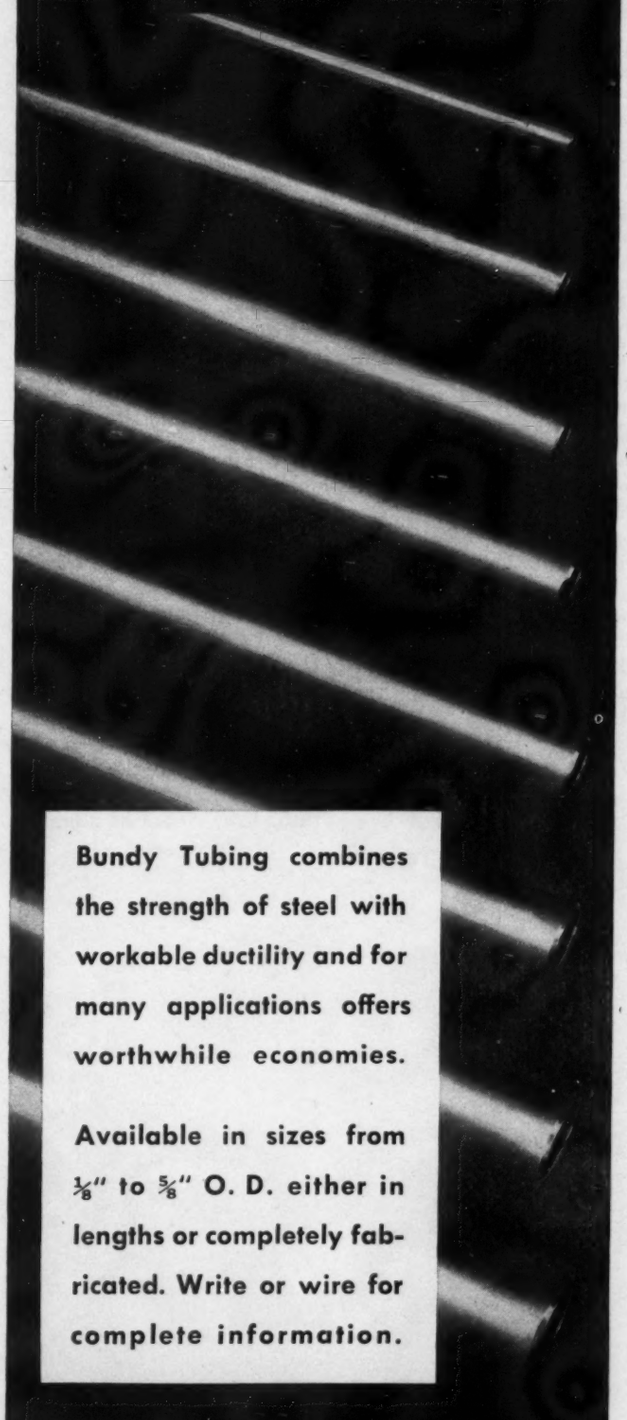
Community Natural Man Dies

John M. Land, 49, sub-district manager for Community Natural Gas Co. at Itaska, Texas, died recently at his home following an illness of several weeks. Mr. Land had started his career in the gas industry in 1910 when he was employed in the pipe line department of Lone Star Gas Co.

BUNDY TUBING

(COPPER COATED STEEL)

Offers Many Advantages in Gas Appliance Manufacture



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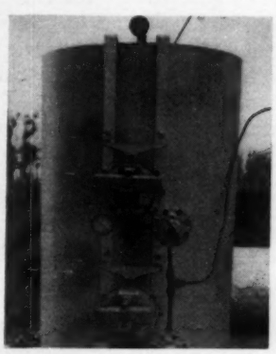
"GASAIR"

THE ONLY COMPLETE GAS-MAKING UNIT

Operating

WITHOUT OUTSIDE POWER

PUBLIC UTILITY STANDBY — Two Gasair combined mixers and vaporizers, 50,000 C.F.H. each, provide ideal standby butane-air service for this natural gas utility.



(Left) INDUSTRIAL STANDBY . . . Two 500 C. F. H. Gasair propane-air mixers mounted on a surge tank, eliminate shut-off from this small industrial natural gas consumer.

These are only two of the many varying installations in which GASAIR equipment is giving complete satisfaction. Names of users supplied on request.

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AT LEFT: C. E. Gill, Sharples Solvents Corp.; David R. Putnam, Northern States Power Co.; H. R. Peirce, Sprague Meter Co.; James L. Griffin, Northern Natural Gas Co.; Amos Abbott, Northern States Power Co. AT RIGHT: T. C. Roderick, Fort Dodge Gas & Electric Co.; A. C. Rathkey, Iowa Public Service Co.; W. L. Hays, Montana Dakota Power Co.; Olin K. Smith, United Light & Power Service Co.

Ames Gas School and Conference Enrolls 250 For Annual Meeting

WITH the extension of its school this year to include a full program on gas utilization, the 19th Annual School and Conference conducted at Ames, Iowa, by the Mid-West Gas Association and Engmeering Extension Service of Iowa State College drew the best attendance of any previous meeting. Approximately 250 registered at the conference held Nov. 13, 14 and 15.

The meeting opened with a general session presided over by C. B. Dushane, Jr., American Meter Co., general chairman. He introduced T. R. Agg, Dean of Engineering, Iowa State College, who welcomed the group to the conference. B. R. Bay, president, Northern Natural Gas Co., next related facts on the growth of the natural gas industry in a paper entitled, "Natural Gas Becomes a Major Mid-Continent Development." He drew a comparison between the modest beginnings of the industry and its present status. Lowered interest rates and longer term investments reflect the present recognition accorded the industry by financial and investment circles and denote the soundness and stability of our industry, he pointed out.

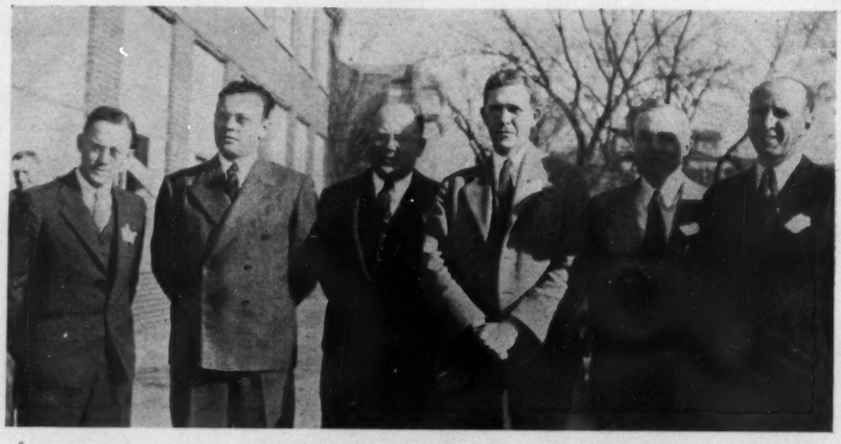
Chairman Dushane also presented Major Alexander Forward, managing director of American Gas Association, attending his first meeting of the school. In bringing a greeting to the school, Major Forward briefly commented upon the favorable position of the industry today. L. W. Mahone, of Iowa State College, chairman of arrangements, was also presented. Later sessions of the school were given over to group meetings of the Production Section, the Gas Distribution Section, the Gas Meter Section, and the Utilization Section and to inspection of manufacturers' exhibits.

The Production Section was presided over by C. A. Bland, vice chairman of the group, in the absence of John M. Drabelle, chairman. The Section presented C. E. Gill of Sharples Solvents Corp. on the subject of "Odorization"; L. A. Kirch, gas engineer, Public Service Co. of Indiana, and F. T. Carpenter, Philgas Dept. Phillips Petroleum Co., on the subject of "New High B.t.u. Process Developed at Lafayette, Ind."; G. M. Arnold, Cutler Hammer, Inc., on "Recent Developments in Automatic Mixing Controls," and A. C. Rathkey, Iowa Public Service, on "Butane-Propane Gas Works and Changeover of Old Systems."

Under the chairmanship of Harold E. Peckham, Northern States Power Co., the Distribution Section presented the following subjects: "Methods of Reconditioning Gas Mains for Prevention of Leaks," by O. K. Smith, The United Light & Power Co.; "Reducing Cost of Repairs Under Pavement," by David R. Putnam, Northern States Power Co.; "High Pressure Gas Distribution Systems to Serve Outlying Territories," R. F. Henneman, Ottumwa Gas Co.; "Cathodic Protection of Mains," R. A. Graham, Iowa-Nebraska Light & Power Co.

In its closing sessions the Distribution Section engaged in a symposium on "New Developments in District Pressure Regulation." Speakers taking part were J. J. Delaney, American Meter Co.; Richard Stafford, Connelly Iron Sponge & Governor Co.; Kenneth R. D. Wolfe, Fisher Governor Co.; L. K. Spink, Foxboro Co.; and Allen D. MacLean, Pittsburgh Equitable Meter Co. Generous discussion was accorded the gas distribution papers and additional subjects presented.

F. C. Hush, Iowa-Nebraska Light & Power Co., presided over the Gas Meter Section. E. L. Fisher, The United Light & Power Co.; T. L. Conner, Peoples Gas & Electric Co.; J. M.



At the Gas School and Conference in Ames, Iowa: F. C. Hush, Iowa-Nebraska Light & Power Co.; Donald R. Bayers, Minneapolis Gas Light Co.; E. A. Brown, Sonner Sales Co.; C. B. Dushane, Jr., American Meter Co., and general chairman of the conference; L. W. Mahone, Iowa State College; Harold E. Peckham, Northern States Power Co.

Pickford, Northern Indiana Public Service Co.; H. J. Sterk, The Peoples Gas, Light & Coke Co.; E. R. Gilmore, Pittsburgh Equitable Meter Co.; A. F. Benson, American Meter Co.; A. V. Brashier, Michigan Consolidated Gas Co., and H. F. Goodenough, Refinery Supply Co., were the speakers.

The opening sessions of the Utilization Section presented Donald R. Bayers, Minneapolis Gas Light Co., on "The Training of Service Men"; F. A. Mueller, Metropolitan Utilities District, in a "Kindergarten on Gases and Combustion for Servicemen"; Mrs. Sarah Wade, Minnesota Valley Natural Gas Co., on "Appliance Servicing from the Women's Viewpoint." In the absence of D. J. Reimers, chairman, E. A. Brown, Sonner Sales Co. vice chairman, presided.

Donald R. Bayers presided over other conferences which presented a service school on Electrolux conducted by a representative of that company, a service school on controls for CP ranges and water heaters, and a service school on house heating controls, chimney liners, etc.

J. E. O'Hagan, Robertshaw Thermostat Co., and Earl Roberts, The Bryant Heater Co., spoke on "Oven Lighting and Thermostats." Dan Piper, White-Rogers Electric Co.; H. G. Wasserlien, General Controls; Carl Swanson, Minneapolis Honeywell Regulator Co.; Don English, Johnson Gas Appliance Co.; J. H. Deane, Detroit Lubricator Co.; R. H. Luscombe, Penn Electric Switch Co., and J. M. Fisher, The Bryant Heater Co., spoke on "House Heating Controls and Equipment."

The annual banquet was held at the Convention Hotel on the second night of the conference.

■ ■

West Ohio Gas Co. Moves Office to New Location

The West Ohio Gas Co. has recently moved to new quarters in Columbus Grove, Ohio. The new location at N. High St. provides twice as much office space as the old building, and has a large display window and more space for showing merchandise. Pauline Kessler is cashier of the local office, and J. F. Warren of Ottawa is manager of the company's northern district, which includes Bluffton, Leipsic, Ottawa and Columbus Grove.

■ ■

R. W. H. Young Dies

Robert W. H. Young, for 45 years associated with the Elrama plant of the Equitable Gas Co. of Pittsburgh, died suddenly on October 2. He had been ill from heart trouble for some time.

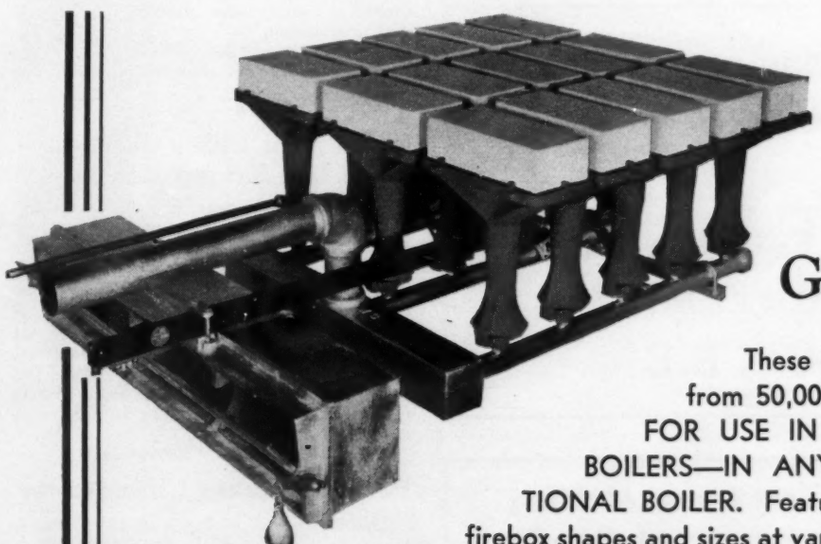
P.C.G.A. Committee Heads and Sub-heads Appointed

THE work of the Pacific Coast Gas Association's new sections and committees is well under way. A. F. Rice, chairman of the Sales and Advertising Section, has enlisted the services of O. R. Doerr, general sales manager of Pacific Gas and Electric Co., as chairman of the Domestic Sales Committee. Charles Grunsky, Chairman of the Accounting Section, has appointed P. W. Walters, district agent of Southern California Gas Co. in Compton, as chairman of the Customers Accounting Committee. H. J. Smith, Chairman of the Technical Section, has appointed M. L. Fort, general superintendent of Industrial Fuel Supply Co., as chairman of the Production Committee. Sub-Committee Chairmanships in the Technical Section are as follows:

Distribution Committee—C. P. DeJonge, San Diego, Chairman; Construction and Maintenance—S. A. Bradfield, Southern California Gas Co. Leakage—E. R. Ames, Southern Counties Gas Co. Special Problems—C. W. Capwell, San Diego Consolidated Gas & Electric Co.

Transmission Committee—Grove Lawrence, Taft, Chairman. Large Volume Measurement—G. H. Briggs, Pacific Gas & Elec. Co. Pipe Lines—C. F. Briscoe, Southern California Gas Co. Pipe Protection—N. K. Senatoroff, Southern Counties Gas Co.

Utilization Committee—J. C. Mueller, Los Angeles, Chairman. Appliance Installation—H. W. Geyer, Southern Counties Gas Co. Appliance Testing—C. A. Thorp, Southern California Gas Co. Special Problems—W. W. German, Montana Power Co.



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Series F600

GAS BURNERS

These burners are available for ratings from 50,000 to 10,000,000 B. T. U. output, FOR USE IN HEATING BOILERS, POWER BOILERS—IN ANY METAL FIREBOX OR SECTIONAL BOILER. Featuring flexibility to meet various firebox shapes and sizes at various gas pressures, and low draft loss. Full automatic controls that operate properly can be easily applied.

GUARANTEED VIBRATIONLESS UNDER ANY LOAD CONDITION

This burner operates on straight natural gas and mixed gas to 800 B.T.U. Gives perfect horizontal distribution.

THE WEBSTER ENGINEERING CO.

TULSA —DIVISION OF— OKLAHOMA

Surface Combustion Corp. . . . . Toledo Ohio

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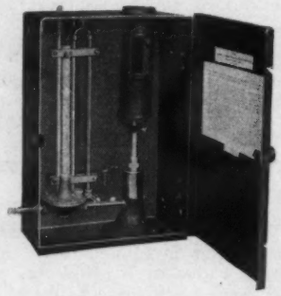
Gas & Heating Specialty Co., Dallas Mechanical Equipment Co., Houston Frank P. Fischer Engineering Co., New Orleans

THE BTU WATCHDOG

CONNELLY CALOROPTIC BTU INDICATOR



Constant visual B.t.u. indication **SAVES LOSSES** due to excessive gas quality variations. No complicated tables or involved calculations—No, sir! It reads directly in B.t.u. and has been designed by practical "gas men" to fill a definite need in the average gas plant—whether it be natural, artificial, mixed, propane or butane gas.

Distant alarm and indicator attachments provide a constant check on B.t.u. content. The low cost of Connelly equipment is easily met by direct savings after installation.

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Just off the press—this new bulletin completely describes the operation of the Connelly Caloroptic B. t. u. Indicator. Fully illustrated. Get your copy today.

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Sell the low cost heating market with MUELLER FLOR-AIRE Gas Furnaces.

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Get Low Cost Metal Melting With Any Type of Gas in JOHNSON'S 300 FURNACE

Johnson's three patented direct jet Bunsen Burners on the Model 300 develop intense heat on natural, manufactured or bottled gas . . . and they do it at lower cost. A durable, economical melting furnace for lead, babbit, solder and other low to medium fusion metals. Removal pot holds 150 lbs. of metal. Start increasing your shop's efficiency and reducing costs now. Write for *free* literature.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA

William C. Copp Is Named Promotion Manager for GAS

WILLIAM C. COPP, for the past several months eastern manager for *GAS*, BUTANE-PROPANE *News* and OIL & GAS *Equipment Review*, has been elevated to the position of promotion manager for the three magazines, which are published in Los Angeles by Western Business Papers, Inc., according to an announcement by Jay Jenkins, publisher. In assuming his new post Mr. Copp will make his headquarters at the Los Angeles office, as of December 15, 1939.

The New York office will then fall under the direction of Elliott Taylor, who last month became eastern editor of *GAS*, BUTANE-PROPANE *News*, and OIL & GAS *Equipment Review*.

Mr. Copp has had wide experience in the publication field, having served as promotion manager for a number of national trade and general magazines in Boston and New York. He was recently connected with the *National Sportsman* in Boston and a group of chemical magazines published in New York.

Mr. Taylor has long been affiliated with and has wide acquaintance in the gas industry, having been one of the group which founded *Western Gas*, predecessor to *GAS*, in 1925, at that time serving as associate editor. Mr. Taylor brings to his new post the many years of experience gained from his activities in the advertising and merchandising aspects of both public utility and dealer. He is a former publicity director for the Pacific Coast Gas Association.

Since moving to New York in 1937, Mr. Taylor has devoted himself entirely to writing, and recently collaborated in a dramatization of Mrs. Taylor's best seller, "Address Unknown," which is scheduled for a Broadway production during the coming theatrical season.

The eastern editorial office of *GAS* has been moved to 381 Fourth Avenue, New York City.

■ ■

Mississippi Utility Women Have Life Saving Lesson

Life saving by means of artificial respiration was demonstrated recently for women employes of the Mississippi Power and Light Co., Jackson, Miss., by two co-workers, Julia Wilson and Dorothy Chester. Safety Engineer Harold Garner explained the process during the demonstration, and stated that the company's accident prevention campaign had cut down considerably the "lost time" accidents.

Organization of a Red Cross first aid class is planned for the Mississippi utility women employes.

■ ■

Portland Makes Changeover

The city council of Portland, Ind., recently granted permission to the Indiana-Ohio Public Service Co., Winchester, Ind., to use natural gas in the Portland distribution system. The new gas, coming from Texas and Michigan, is to contain 950 B.t.u.'s, and is to be served at the same prices as before. No change in burners will be made.

■ ■

Otto H. Kampe Passes Away

Otto H. Kampe, an employe of the St. Louis County Gas Co., Webster Groves, Mo., since 1911, passed away September 24 at Hot Springs, Ark., where he was vacationing at the time. He had been night operating engineer for his company for many years.

Preview of coming campaigns by

P·G·and E·

PACIFIC GAS AND ELECTRIC COMPANY

GAS APPLIANCE SOCIETY OF NORTHERN CALIFORNIA

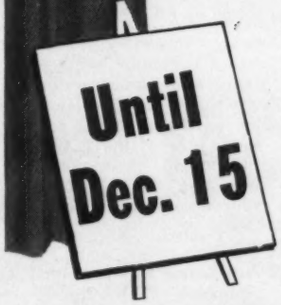
25% ADVERTISING REBATE EXPIRES DECEMBER 15th

There's not much time to go! Unless the money runs out before then, the P. G. and E.'s offer to pay 25% of dealers' GAS RANGE advertising space cost expires promptly on December 15. That's less than two weeks!

See our local office and plan to take advantage of this liberal advertising assistance. The main conditions are simply that the range must qualify under the Gas Appliance Society's "Sticker Plan," and must have a built-in gas circulating heater of 18,000 B.t.u. or more.

Write your copy now! Get clearance through your local P. G. and E. office and have it in the paper tomorrow. Follow it up in a day or two with another ad, and then another.

Put on a really concerted drive between now and December 15, and you will have both the P. G. and E. and Old Man Weather behind you.



G 212-1239

DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Gas Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Gas Appliance Society, 1355 Market Street, San Francisco, California.

INDUSTRY *Personalities*

Carl Wierum, industrial sales engineer of the Broooklyn Union Gas Co., Brooklyn, N. Y., has recently been appointed industrial sales manager, succeeding Frank B. Herty who resigned. **John B. Frost,** also an industrial sales engineer, was named assistant industrial sales manager to succeed **Alva L. Palmer,** who has been appointed industrial utilization engineer.

Mr. Wierum is a graduate of the U. S. Naval Academy and has been with Brooklyn Union since 1931. Mr. Frost, who was graduated from Brooklyn Polytechnic Institute, has been with the company since 1935. Mr. Palmer, also a graduate of Brooklyn Polytechnic Institute, was first employed by the company from 1911 to 1913. After serving the Consolidated Gas Co. until 1925, he rejoined Brooklyn Union as an industrial engineer.

A. Emory Wishon, vice president and assistant to the general manager, Pacific Gas and Electric Co., San Francisco, Calif., was recently presented a gold pin in honor of his 30th year of service with the company at a special luncheon at the Sir Francis Drake Hotel, San Francisco. P. M. Downing, vice president and general manager of P. G. and E., made the presentation.

Bruce Hodgdon, formerly in the new business department of the Wyandotte County Gas Co., Kansas City, Kan., has been appointed new business representative in the sales department of The Gas Service Co. at Merriam, Kan. **E. F. Wilcox,** of the new business department, Kansas City (Mo.) Gas Co., has also been made a new business representative of The Gas Service Co., Merriam.

Louis L. Roesle, manager of The Gas Service Co. at St. Joseph, Mo., was recently elected a member of the executive committee of the Missouri Association of Public Utilities. He replaces Fred Karr, who has been transferred to the company's Topeka branch as manager.

New business managers attending the American Gas Association convention in New York were invited by **Thomas F. Kennedy,** New York new business manager, to attend a meeting on October 13 at the company's New York office.

W. H. Adams, safety director for Columbia Gas and Electric's Pittsburgh group, chats with W. G. Russell, traveling representative for GAS, as he makes his rounds in the Pennsylvania territory.

G. H. Dorr, manager of sales, Milwaukee (Wis.) Coke and Gas Co., has announced the appointment of **J. A. Bouffard** to the position of assistant sales manager. Mr. Bouffard was formerly sales manager of the Hamilton (Ohio) Coke and Iron Co.

Stanley A. Knisely, advertising manager of Republic Steel Corp. for the past five years, has been elected to the office of executive vice president of the Associated Business Papers, Inc., by that organization's executive committee. He succeeds H. J. Payne.

Chester W. Ruth, assistant advertising director of Republic Steel Corp., Cleveland, was promoted to director of advertising, succeeding Mr. Knisely. **Harold H. Oldham** has been appointed to fill Mr. Ruth's former position.

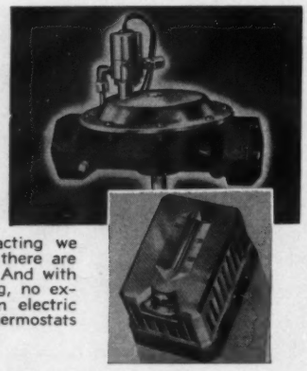
Lloyd C. Ginn, sales promotion manager of the American Stove Co., Cleveland, Ohio, has been named chairman of the CP Sales Management Committee of the A.G.A.E.M. for 1940. Mr. Ginn will direct the CP gas range sales promotion, for which utilities, dealers and range manufacturers will spend nearly $1,000,000.

B. Frank Newhouse was presented with a radio on September 29 by the 59 men under his supervision in the meter reading department of the Cincinnati Gas and Electric Co. The occasion celebrated his 42nd anniversary with the company, he having begun as a gas meter setter's helper in 1897, at the time when service push carts were being replaced by horses and wagons.

John Abbott, employed by The Gas Service Co. at Arkansas City, Kan., retired recently, having been in the gas business since 1903.

H. Mike Meuffels, formerly gas engineer for Missouri Power and Light Co., has recently been appointed sales engineer in charge of the midwest office of the Reynolds Gas Regulator Co., at Kansas City, Mo. Mr. Meuffels was graduated from the

They Make A GOOD PAIR for Controlling Gas Heaters



Klixon controls give you snap-acting control. And by snap-acting we mean sensitive, close, quick and **quiet** control. With the valves there are no solenoid troubles—no sticking, no humming, no chattering. And with the room thermostats there are no radio interferences, no arcing, no exposed live parts, no undesirable reactions to vibrations. Klixon electric gas valves come in ⅜" to 1¼" I. P. S. through 1000 cu. ft. Thermostats in many attractive finishes. Write for complete information.

KLIXON

SPENCER THERMOSTAT CO.
ATTLEBORO, MASSACHUSETTS, U. S. A.

GAS—810 South Spring Street, Los Angeles, California

Yes! SEND ME GAS *for* ☐ 3 Years at $2.00

SUBSCRIPTION RATES: United States, Canada, Mexico and Central American countries (in advance), three years $2.00; all other countries, $3.00 per year.

Name.....Position.....
Company.....
Address.....
City.....State.....
☐ Check enclosed ☐ Send bill

University of Kansas in 1922, having interrupted his college career to serve in the World War. After leaving the university he was employed by Empire Oil and Refining Co., Bartlesville, Okla., and later served the Thomas-Moncrief Oil Co., Winfield, Kan., until 1931 when he joined Missouri Power and Light Co.

Kansas City offices of the Reynolds Gas Regulator Co. are at 422 Dwight Building.

The Consolidated Electric and Gas Co., Jersey City, N. J., has recently announced the appointment and transfer of several managers of its subsidiary companies. **Ralph Frye,** formerly at Stroudsburg, Pa., has been named manager of the Raleigh (N. C.) Gas Co. to succeed **L. E. Hurst.** Mr. Hurst has been transferred to the Haverhill (Mass.) Gas Light Co. From his office at Raleigh, Mr. Frye will also supervise the offices at Durham and Asheville, N. C. **D. K. Taylor,** formerly at Durham, has been transferred to Asheville.

E. H. ROSEBERRY

Elwood H. Roseberry, formerly Los Angeles branch manager of Sprague Meter Co., Bridgeport, Conn., has recently assumed his new duties as vice president of the company. Mr. Roseberry was unanimously elected to this position at a meeting of the board of directors on October 5. He will continue to maintain his office is Los Angeles.

Mr. Roseberry is a graduate of the University of Pennsylvania Engineering School, class of 1913, with a degree in mechanical engineering. He has been branch manager of the company in Los Angeles since 1928.

T. B. Gregory, chairman of the board of the Manufacturers Light and Heat Co., Pittsburgh, Pa., which is a member of the Columbia System, recently celebrated his 79th birthday. Mr. Gregory, who is still in active service, has been with Columbia System companies for more than 55 years.

C. I. Weaver, president and general manager, Ohio Fuel Gas Co., Columbus, has recently been made a trustee of the local Better Business Bureau for 1940. **Howard Minnich,** also of Ohio Fuel Gas Co., has been appointed chairman of the public relations committee of the Columbus Advertising Club for the coming year.

L. P. Fessenden, district manager of Wisconsin Power and Light Co. at Sheboygan, was honored at a banquet on his 50th anniversary with the utility industry, October 16. Attendance at the banquet was about 300.

The United Natural Gas Co. has appointed **L. L. Berrean** to act as agent temporarily, at Bradford, Pa., to fill the vacancy created by the death of Raymond R. Crowe.

C. C. Johnson, construction engineer with the Ohio Fuel Gas Co., Toledo, has been appointed to head the Industrial-Commercial Division of the annual Red Cross Roll Call. Mr. Johnson has assisted this division in the drive for several years.

PROPANE or BUTANE CONVERSIONS mean GREATER PROFITS!

You are in business to make profits. Why pass up this opportunity any longer?

Water-gas or coal-gas plants converted to Butane-air or Propane-air offer these two important advantages:

1. Reduced production and distribution costs.
2. Lower plant equipment replacement costs.

A letter or a phone call will immediately place the wide experiences of Philgas engineers at your disposal. There will be no obligation on your part.

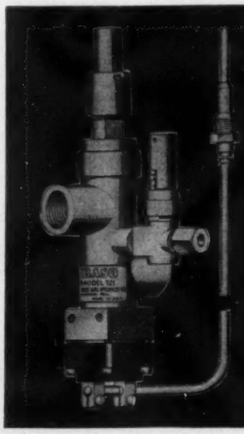
Philgas DEPARTMENT
PHILLIPS PETROLEUM COMPANY
GENERAL MOTORS BUILDING
DETROIT, MICHIGAN

NEW YORK
PHILADELPHIA
CHICAGO

BARTLESVILLE, OKLA.

MILWAUKEE
ST. LOUIS
AMARILLO

NATION'S LARGEST MARKETER OF LIQUEFIED PETROLEUM GASES



MODEL BASO 721
ONE UNIT
FLOOR FURNACE CONTROL
COMBINES
BASO, BURNER VALVE, PILOT VALVE
PROVIDES COMPLETE SAFETY
FOR ADDITIONAL INFORMATION WRITE:
MILWAUKEE GAS SPECIALTY CO.
MILWAUKEE - WISCONSIN

HEATING COMFORT
For Every Size of Home
Make better profits from satisfied customers by giving them correct heat for their home.
For every home—old or new—large or small—there is a type and size of Fraser equipment that assures comfort with economy — builds customer goodwill.
NEW!!!
P.A.C.—The very latest development in heated, conditioned air units—in a class by itself—be sure to ask for details.
FRASER LEADS WITH
Winter Air Conditioning—Basement Furnaces — Floor Furnaces—Tuckaway Heaters—Double Wall Furnaces—Consoles.
SELL HEATING COMFORT
It's the INSIDE of the Furnace That Counts
Distributed by
H. R. BASFORD CO.
San Francisco - Los Angeles
Manufactured by
FRASER FURNACE CO.
Stockton, California

FRASER
GAS HEATING EQUIPMENT

For 1940

Welsbach
HOTZONE
Welsbach
AUTOMATIC GAS WATER HEATERS
WELSBACH COMPANY
Gloucester City, N. J.

Following a meeting of the board of directors of The North American Co., New York City, November 1, announcement was made that in furtherance of a plan to enlarge the company's executive organization **Harrison Williams,** formerly chairman of the executive committee, was elected chairman of the board of directors; **James F. Fogarty,** formerly president, was elected chairman of the executive and finance committee; and **Edward L. Shea** was elected president.

The enlargement of the company's executive organization will enable Mr. Fogarty to devote attention primarily to financial and corporate matters. Accordingly, the executive committee's administrative scope has been increased and its name changed to the executive and finance committee, with Mr. Fogarty as chairman. Other members of the new committee, besides Messrs. Fogarty, Williams, and Shea, are **George Murnane** and **Herbert C. Freeman,** a vice president of the company.

William A. Hudson, formerly with the Fuel Division of the United Gas Corp., Houston, Texas, has joined the sales organization of the Laclede Gas Light Co., St. Louis, Mo., as supervisor of both the house heating and water heating sales divisions. He succeeds **Lee A. Brand,** resigned. **H. J. Keane** will assist in the training of new water heating salesmen.

It was further announced that the company's refrigeration and range divisions have been consolidated and are to be known as the domestic division. **Ben E. Betts** and **M. A. MacClurg** will supervise the southern and northern territories respectively, of the domestic division.

Walter B. Wessels, formerly assistant treasurer, has been appointed secretary of The Porcelain Enamel & Manufacturing Co., Baltimore, Md.

O. W. Brewer, auditor of the American Gas Association, for the ninth consecutive time was re-elected treasurer of the Controllers' Institute of America at the annual meeting held in New York in October.

M. V. Cousins has been named personnel director of the Magnolia Gas Co., an affiliate of United Gas Corp., Houston, Texas. Mr. Couisins has served 14 years with the Magnolia firm, occupying varying positions from machinist to chief engineer.

Clarence G. Ingersoll, with the service bureau of the East Bay division of Pacific Gas and Electric Co., San Francisco, has been awarded the grand prize of the James B. Black Sales Crusade, the 1939 business promotion campaign which has been in progress since the first of the year. The prize: a 19-day trip to Honolulu for the winner and his wife, transportation, hotel expenses, and $100.00 incidental expense money.

This month among employes of the Equitable Gas Co., Pittsburgh, Pa., one man, **James O. Farster,** passed the 45-year service mark. Four others, **Magnus G. Dorsch, Robert C. Kerr, Percy E. Jackson,** and **James F. Gilbert,** have completed 30 years of service.

H. E. Wedge, formerly manager of the Peoples Natural Gas Co. office in Wayne, Neb. has been transferred to Spencer Iowa where he will supervise five towns.

H. C. Holder, for the past 10 years manager of the Council Bluffs (Iowa) Gas Co., has retired from active duty after 40 years service with the company. **Carl B. Stephens,** auditor, succeeded Mr. Holder as manager as of November 1. **L. W. Jacobs** has been named superintendent of the plant. The company is an affiliate of the Lone Star Gas Co. of Dallas, Texas.

Senator Clay Cotten of Palestine, Texas has accepted the position of director of the gas utilities division of the Texas Railroad Commission, succeeding **Olin Culberson,** according to a Commission announcement. Mr. Cotten will resign his senatorship.

Robert E. Dickenson, Jr., Enid division employe of the Oakland Natural Gas Co., has returned to his duties, following recovery from a serious nervous illness.

David W. Sawyer, formerly meter setter, reader and fitter at Corsicana for the Community Natural Gas Co., has been appointed sub-district manager for the company at Itasca, Texas, in the Hillsboro district, it was announced recently by L. B. Denning, Jr., vice president and operating manager. Mr. Sawyer has been in the gas industry since 1922.

Mr. Denning also announced the appointment of **Benjamin C. Bennett,** fitter in the Stamford district, to the position of sub-district manager at Rotan, Texas. Mr. Bennett joined Lone Star Gas System in May, 1930.

Troy B. Jackson, Dallas (Texas) Gas Co. new business solicitor, was the first salesman in Texas to receive the CP Ranger award for selling 25 CP ranges in 1939. This award is a bronze lapel button presented by the A.G.A. Mr. Jackson made his required number of sales in seven months.

Raymond A. Turner, employed in Lone Star Gas Co.'s Ranger pipe line district, has been appointed assistant foreman of the district with headquarters in Ranger, Texas. He replaces Herman B. Dempsey, who has been transferred to the Moran district.

The United Natural Gas Co., Oil City, Pa., through its board of directors, has elected **Anson C. Burwell** to the position of vice president in charge of engineering, and **James G. Montgomery, Jr.,** to vice president in charge of production and geology.

The directors appointed **D. E. Conoway,** chief geologist and **George F. Gearhart,** chief engineer, the positions formerly held by Mr. Burwell and Mr. Montgomery, respectively.

■ ■

Production Committee Meets

Under the Chairmanship of J. French Robinson, president of the Peoples Natural Gas Co., Pittsburgh, the Production Committee of the Natural Gas Section of the A.G.A. held the first meeting of its new fiscal year in Chicago, November 13. The 22 committee members present discussed the subjects that will be undertaken in the 1939-40 program of the Association.

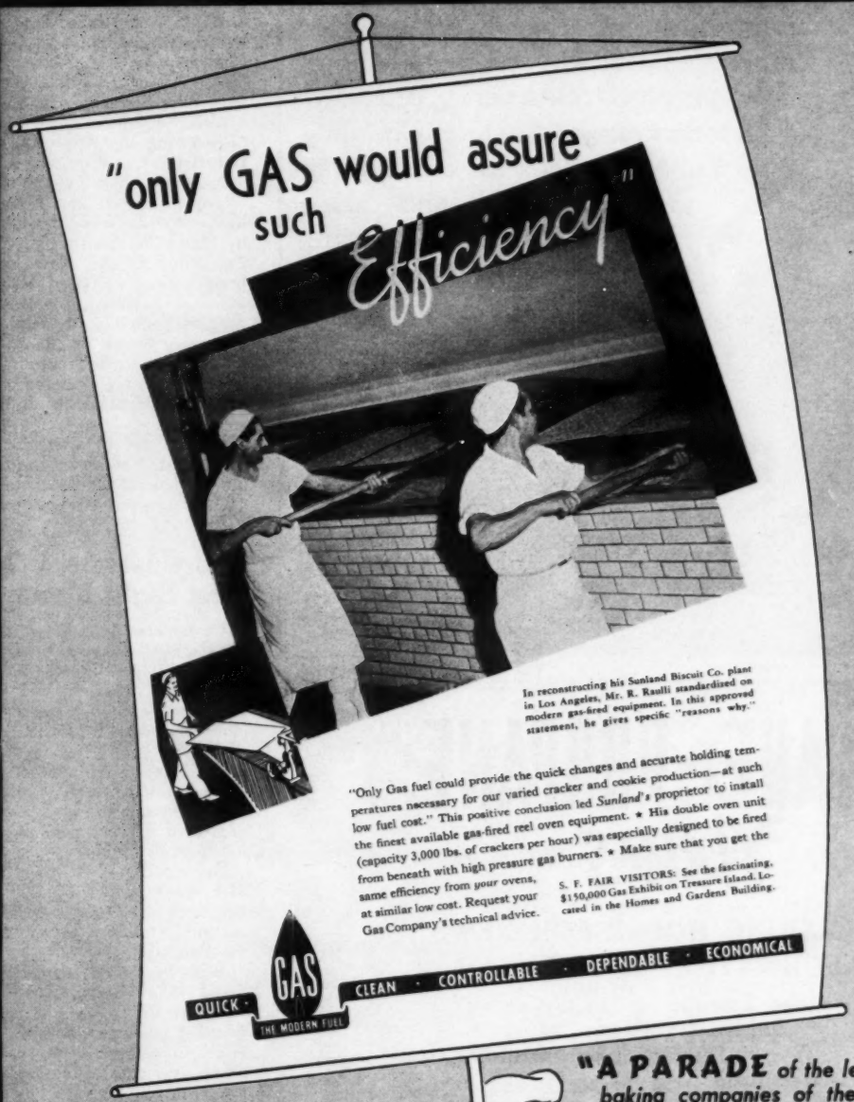
■ ■

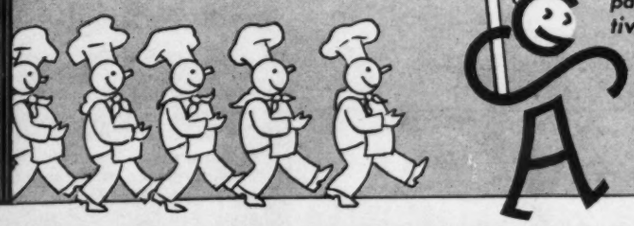
Model Home Gas Equipped

The "Life" model home that was constructed in Pittsburgh for Verne W. Davis by Architect Richard Koch is an all-gas project. House heating, water heating, cooking and refrigeration are all performed by gas served by the Equitable Gas Co., Pittsburgh.

P.C.G.A. PREVIEW

COOPERATIVE LOAD-BUILDING


"only GAS would assure such Efficiency"
In reconstructing his Sunland Biscuit Co. plant in Los Angeles, Mr. R. Raulli standardized on modern gas-fired equipment. In this approved statement, he gives specific "reasons why."
"Only Gas fuel could provide the quick changes and accurate holding temperatures necessary for our varied cracker and cookie production—at such low fuel cost." This positive conclusion led Sunland's proprietor to install the finest available gas-fired reel oven equipment. * His double oven unit (capacity 3,000 lbs. of crackers per hour) was especially designed to be fired from beneath with high pressure gas burners. * Make sure that you get the same efficiency from your ovens, at similar low cost. Request your Gas Company's technical advice.
S. F. FAIR VISITORS: See the fascinating, $150,000 Gas Exhibit on Treasure Island. Located in the Homes and Gardens Building.
QUICK · CLEAN · CONTROLLABLE · DEPENDABLE · ECONOMICAL
GAS
THE MODERN FUEL



"A PARADE *of the leading baking companies of the West marches with me through the pages of Western Baker in attractive ads endorsing gas fuel."*

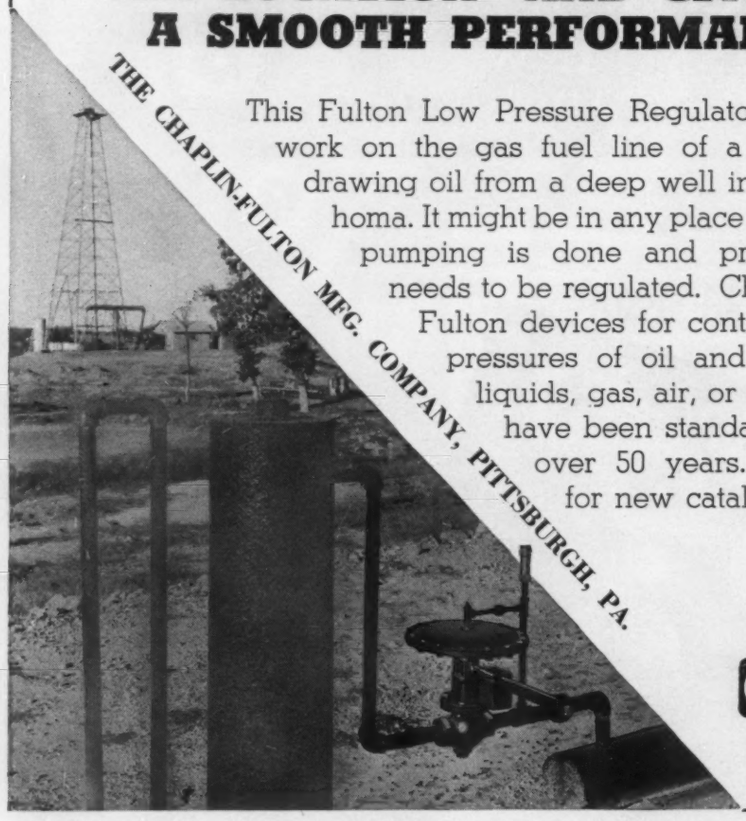
Commercial Baking is one of eight important classifications covered by the Gas Industry's regional trade journal advertising.

P. C. G. A.
H. L. Farrar, President
Clifford Johnstone, Managing Dir.

DECEMBER 1939

COMMITTEE
A. C. Joy, P. G. & E.
J. S. Spaulding, So. Calif. Gas Co.

"ON LOCATION" AND GIVING A SMOOTH PERFORMANCE



This Fulton Low Pressure Regulator is at work on the gas fuel line of a pump drawing oil from a deep well in Oklahoma. It might be in any place where pumping is done and pressure needs to be regulated. Chaplin-Fulton devices for controlling pressures of oil and other liquids, gas, air, or steam, have been standard for over 50 years. Ask for new catalog.

CF

BUTANE-PROPANE *News*

THE CLEARING HOUSE FOR NEWS AND INFORMATION ABOUT . . .

Transportation and Storage
Safety Practices
Industrial and Standby Uses
Bottled Gas Distribution
Semi-Bulk Distribution
Dealer Sales and Service
New Appliances and Equipment
Internal Combustion Engines
Town-Plant Operation and Load Building
Etc., Etc., Etc., Etc.

BUTANE-PROPANE News
810 South Spring Street, Los Angeles, Calif. _____ **1939**
Please enter my name as a subscriber to BUTANE-PROPANE News.
Checked enclosed_____
Send bill to:

Name_____ **Position**_____

Company_____

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Street **City** **State**

SUBSCRIPTION RATES—United States, Canada, Mexico, Cuba, South and Central American Countries, three years for $2.50. All other countries, $3.00 per year.

Midwest Industrial Sales Council Meets in Chicago

BY scheduling its fall meeting concurrently with the National Metal Congress and Exposition, the Midwest Industrial Gas Sales Council of the Industrial Gas Section, American Gas Association, attracted an attendance of 75 gas men from Kansas to New Jersey to the Palmer House, Chicago, October 26, 1939.

William M. Riach, Jr., sales engineer, The Peoples Gas Light and Coke Co., and 1939 Chairman of the Council, opened proceedings. Elmer F. Cook, American Gas Furnace Co., Elizabeth, N. J., took the floor to describe equipment and outline methods for "Promoting the Application of Standardized Industrial Gas Equipment."

Another phase of the selling problem, "Your Industrial and Commercial Gas Publicity As a Sales Tool," was interpreted by Harry W. Smith, Jr., director, Industrial Publicity, A.G.A., New York. Mr. Smith's presentation included displays of all the national publicity, together with the media used, obtained in behalf of non-residential gas departments by the A.G.A. in 1939.

"Modern Heat Treating Methods and Applications" were discussed by W. A. Darrah, president, Continental Industrial Engineers, Inc.

During the evening the delegates visited the A.G.A. Combined Industrial Gas Exhibit on the floor of the National Metal Exposition at International Amphitheater.

■ ■

Gas Customers Gain in First Eight Months

Customers served by manufactured and natural gas utilities totalled 17,206,900 on August 31st, an increase of 372,200 over the number reported on the same date a year ago, it was announced recently by Paul Ryan, chief statistician of the American Gas Association.

Revenues of manufactured and natural gas utilities aggregated $551.321,500 for the first eight months of 1939. This was an increase of 5.5 per cent over the corresponding period of 1938.

During the eight months ending August 31st, some 123,997,200,000 cu. ft. of natural gas were used in generating electric power in public utility steam plants throughout the country.

According to figures released by the Pacific Coast Gas Association, Pacific coast gas sales are up 14.0 per cent for the first eight months, customers up 3.5 per cent and revenue up 4.9 per cent, this last in the face of general rate reductions.

■ ■

United Gas Corp. Ties In With National Advertising

The national advertising campaign of the American Gas Association is being actively complemented by the United Gas Corp., Houston, Texas, in an aggressive pre-holiday local drive that features the advantages of natural gas for domestic use.

The keynote of all the advertising is what is termed "the Big 3," the gas range, the gas water heater and the gas refrigerator.

■ ■

New Four-Mile Line Built

A four-mile pipe line is being constructed from the Southern Union gas well No. 1 on the A. A. Williams lease three and one-half miles northeast of Ozark, Ark., to join the line from Clarksville to Fayetteville.

You Can't Beat a John Zink
CONVERSION FURNACE BURNER

LOW IN COST
$10.50 f. o. b. Tulsa, for the Burner—
Complete with automatic controls, $35.00.

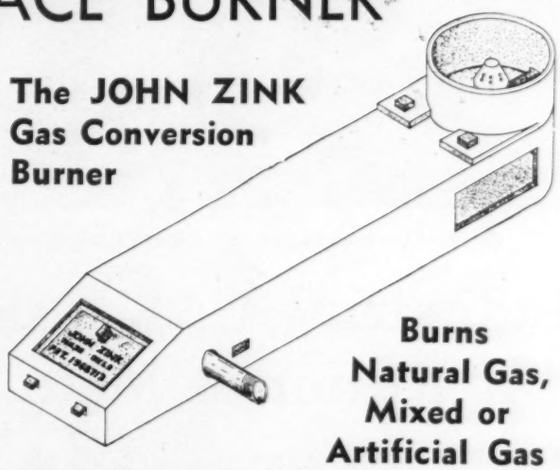
EASY TO INSTALL
Any customer can install it.

STRONG AND DURABLE
All in one piece, made of cast iron.

EFFICIENT—Tested and approved.

8,000 Installations

The JOHN ZINK Gas Conversion Burner



Burns Natural Gas, Mixed or Artificial Gas

Capacity 175,000 B.t.u. Per Hour

JOHN ZINK BURNERS - Tulsa - New York

TULSA PLANT — 4401 South Peoria Avenue NEW YORK CITY — 342 Wabash Avenue

PROTECTS GAS USERS

"CALODORANT" gives a swift warning against leak danger.

CALODORANT gas odorizing agent has a distinctive and penetrating odor that is generally associated with manufactured gas.

For over eight years leading gas companies have found it to be a vigilant detector of dangerous and costly leaks. Immediately upon the addition of CALODORANT to gas it gives warning of leaks in distributing systems and household appliances . . . a warning that may prevent loss of life and property. It adds no odor to burning gas. It is non-corrosive . . . non-injurious to equipment or users. CALODORANT will remain completely vaporized during long periods of transmission and the odorizing power remains unimpaired.

CALODORANT

REG. U. S. PAT. OFF.

GAS ODORIZING AGENT

AVAILABLE IN TANK CARS AND IRON BARRELS

Address Inquiries to

STANDARD OIL COMPANY OF CALIFORNIA

225 Bush Street, San Francisco, Calif. 30 Rockefeller Plaza, New York, N. Y.

Combined gas exhibit at the 1939 National Metal Congress and Exposition.

Industrial Gas Holds Spot At National Metal Show

WORKING displays of industrial gas and gas equipment, sponsored by the A.G.A., 11 manufacturers, and 21 utilities, were viewed at the International Amphitheater, Chicago, by some 32,000 people who attended the National Metal Congress and Exposition, held during the week of October 23-27.

The A.G.A. combined exhibit was the largest single unit at the show, covering 6000 sq. ft. of floor space, and was designed by Harry Swenson, manager, display section, Peoples Gas Light and Coke Co. Eugene D. Milener and Harry W. Smith, Jr. represented the Industrial Gas Section of the A.G.A. at the exhibit.

The display was so designed that as each visitor entered the Amphitheater through the main entrance he was confronted with the gas exhibit stretching on either side for a distance of 80 ft. In the display booths of the 11 cooperative equipment manufacturers at least two-thirds of the apparatus shown was new to the metal industry, rather than redesigns of old equipment.

The first morning after the opening of the Exposition, October 24, the A.G.A. Industrial Gas Section gave a breakfast at the Palmer House for all industrial gas men attending the show and all representatives of exhibiting manufacturers. Franklin T. Rainey, general sales manager, the Ohio Fuel Gas Co., Columbus, and new chairman of the A.G.A. Industrial Gas Section, presided. Featured speaker was F. X. Mettenet, vice president, the Peoples Gas Light and Coke Co., Chicago, who stressed the importance of the industrial gas load to the gas industry.

■ ■

Michigan Company Plans Pipe Line and Gas Plant

The West Michigan Consumers Co., Muskegon, Mich., has announced its plans to construct an 8-in. pipe line from the Kent county oil field to Ravenna, a distance of 20 miles. At Ravenna the proposed line would join a 12-mi. line to Muskegon, through which line the company has supplied boiler fuel for large industries in that city since 1936. The cost of the new line would be about $90,000, it was estimated by John L. Robinson, general manager of the company. It will be started as soon as the state public service commission approves the project.

Mr. Robinson has also announced plans for a new $100,000 casinghead gasoline plant five miles west of Grand Rapids, Mich., which would be erected by a new concern known as the Pent Hex Corp., headed by Mr. Robinson.

■ ■

Gas Heating Slogan Wins Favor of 100 Companies

More than 100 gas companies have adopted for their gas heating advertisements the national slogan sponsored by the A.G.A., "Join the Swing to Heating by Gas," which was suggested by the Heating and Air Conditioning Committee, and approved by the A.G.A.E.M. Some companies are using it on lawn signs, truck signs, billboards, direct mail and newspaper advertising, stickers, window signs, blotters, lapel buttons, pencils, playing cards, bridge score pads, etc. Such promotional items are prepared at supply sources established by the Association, in order to give the gas company the price benefit of volume manufacturing costs.

■ ■

Former Range Official Dies

David Edward Dangler, 82, retired vice president of the American Stove Co., Cleveland, Ohio, died recently at his home in Cleveland.

■ ■

R. S. Weaver Passes

Ralph S. Weaver, a director of the Allentown-Bethlehem Gas Co., died October 27, at his home in Catasauqua, Pa. He was 67.

For POSITIVE FLOW-CONTROL of gas, oil, water, steam, and air at MINIMUM COST, specify CRANE-QUALITY valves, fittings, fabricated pipe, and piping accessories.

CRANE

VALVES · FITTINGS
PIPE · PLUMBING
HEATING · PUMPS

CRANE CO., GENERAL OFFICES: 836 SOUTH MICHIGAN AVENUE, CHICAGO
NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

INDUSTRIAL GAS BOILERS

Plain tubular . . . . . ¾ to 10 H.P.
Water Leg tubular . . 5 to 45 H.P.
HE Flueless . . . . . 1 to 18 H.P.

ASME Code for 100 lbs. S.W.P., also for higher pressures.
Non-electric Low Water Cut-offs for all types of boilers.

P. M. Lattner Mfg. Company
CEDAR RAPIDS IOWA

Empire State Association Holds Annual Meeting

OVER 200 executives and department heads of various gas and electric utilities met at the 34th annual convention of the Empire State Gas and Electric Association at the Westchester Country Club, October 19 and 20. Clarence L. Law, vice president, Consolidated Edison Co. of N. Y., was general chairman of the convention.

Edward P. Prezzano, president of the Westchester Lighting Co., who a few weeks before at a meeting of the Executive Committee had been re-elected the Association's president, presided at the first session. At the same meeting of the Executive Committee, Irving K. Peck, president of the Binghamton Gas Works was re-elected vice president, and he presided at the second business session. Herbert C. Davidson, vice president of the Consolidated Edison Co. of New York, was re-elected Treasurer.

Mr. Prezzano opened the convention with an address in which he indicated the value of association activities and the fruits of cooperative effort. Conrad N. Lauer, retiring president of the American Gas Association, delivered a talk on the gas industry's future and spoke of the contribution to that industry and to the management of the American Gas Association made by men from the Empire State.

Hall M. Henry, assistant to the president of the New England Gas and Electric Association, spoke on "Increasing the Gas Net Revenue," in which he indicated that not only operating economy but predominantly sales effort was the key to success.

Davis M. DeBard, vice president of the Stone & Webster Service Corp., spoke on "Load Building," in which he emphasized the importance of market analysis and the necessity of the industry getting a just share of consumer income.

■ ■

Oklahoma Utility Completes $100,000 Compressor Plant

The new $100,000 natural gas compressor station of the Consolidated Gas Utilities Corp., of Oklahoma City., Okla., constructed by E. C. Joullian, executive vice president, at Twitty, Texas, was put in operation September 21. Construction was started July 24 under supervision of C. S. Worley, engineer of the company.

The new station has a total capacity of 33,000,000 cu. ft. of gas per day at the present intake pressure of about 165 lbs. Only two of the three 400-hp. units are now in operation, but the plant will be operating at full 1200-hp. capacity when seasonal demands become heavier.

■ ■

Republic Steel Completes Tube Mill in Youngstown

A new tube mill for making one-half in. to extra heavy three-in. butt welded pipe in any lengths from one ft. to 45 ft. by the Fretz-Moon process has just been completed and put into operation by Republic Steel Corp., in Youngstown, Pa. A recuperator type furnace, 150 ft. long, is used, with three heating zones fired with rows of burners using coke oven gas.

■ ■

Pittsburgh Foreman Dies

John C. Murning, retired foreman of the Pittsburgh Group of utilities of the Columbia System, died recently at Steubenville, Ohio, at the age of 77. He had been with the System 31 years.

MUELLER GAS DISTRIBUTION EQUIPMENT

The time-tested Mueller line includes Mueller Eventflow Service Regulators, Gas Stops, Service Stops, Stove Stops, Drilling and Tapping Machines, service boxes, meter trims and similar equipment. Write for description and prices.

MUELLER CO., Los Angeles, Calif.

Factories: Decatur, Ill.; Chattanooga, Tenn.; Los Angeles, Calif.; Sarnia, Ont.
Branches: New York and San Francisco

VENT-A-HOOD . . . sensational new patented kitchen ventilator—NOT A FAN—grease trap and centrifugal exhaust unit removes cooking odors from kitchen before they can invade other parts of the house. Prevents greasy vapors from settling on walls —saves housework. Keeps kitchen cool. Biggest innovation since mechanical refrigeration.

FREE TRIAL Sales Plan

Write for particulars of our FREE Trial Selling Plan. If Vent-A-Hood doesn't prove it will sell for you, there's no obligation.

The VENT-A-HOOD Co.
2808 COMMERCE STREET
DALLAS, Dept. L TEXAS

Payne SELLS GAS!

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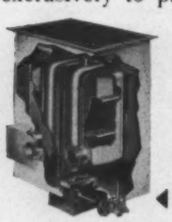

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CURRENT *Reading*

A Review of the U. S. Bureau of Standard's Work During 1939 on Underground Corrosion—K. H. Logan. *Oil and Gas Journal,* Sept. 21, 1939, pp. 112, 115, 118. Statistical studies of pit depths on pipe lines show that the condition of a pipe line with respect to the maximum pit depths on any chosen unit of length can be determined with any desired precision by making a sufficient number of systematic observations. Several ways of doing this are described. A comparison of several methods commonly used for estimating the corrosivity of soils shows that the result of any test of a single sample of soil is unreliable as a measure of corrosion on the adjacent section of pipe line. The average corrosivity of a region or a soil type can be roughly determined by several methods. A half cell which permits a more accurate determination of the potential of a pipe with respect to the adjacent soil has been developed. Curves showing the changes in potential of the anode and cathode of an electrolytic corrosion cell as the current density is increased are of value not only in the measurement of the corrosiveness of soils, but also in the study of corrosion processes.

Cooling Tower Performance Studies—L. M. K. Boelter. *Heating, Piping and Air Conditioning,* Oct., 1939, pp. 639-647. Progress on the specific problem of evaporative cooling of water by direct contact with air is being made. The variables have been segregated and the effect of each independent variable will be studied separately. For instance, models of the full-scale atmospheric towers will be placed in a wind stream of known turbulence in order to study the air flow through them. Air-free water will be used to determine the effect of dissolved gases. Further progress will be made in the ensuing year. The studies in drop dynamics and the related computations on the evaporative cooling of water drops to follow will take available design data of fundamental importance. Several effectiveness ratios of cooling towers have been proposed based on the concept of an air heating device and of a water cooling device. Each has its place in design calculations.

Technology, Employment and Output Per Man in Petroleum and Natural Gas Production—WPA National Research Project. The report asserts that all indications point to steadily increasing fuel demands for many years. In addition, invention and improved production techniques serve constantly to reveal new uses for, and by-products of, petroleum and natural gas. These create new industrial demands which, in turn, create new demands for labor. This expanding technology is not expected to abate within the next 10 or 15 years, states the report.

Microbiological Anaerobic Corrosion of Steel Pipe Lines—Raymond F. Hadley, *Oil and Gas Journal,* Sept. 21, 1939, pp. 92, 94, 96. Pipe line corrosion engineers have not given sufficient thought to the destructive action of sulfate reducing microbes present in wet lands through which pipe lines pass, according to the author. To prove this he cites the result of research completed over a period of several years and suggests practical tests to detect this type of corrosion on existing lines.

Routing Nightmares of Water Conditioning—R. E. Hall, E. P. Partridge, and T. H. Daugherty. *Mechanical Engineering,* Oct., 1939, pp. 715-721. Comprehensive data and suggestions on boiler water conditioning given.

Material Specifications for Pumps—Published by Hydraulic Institute, 90 West St., New York City (price, 25 cents). These specifications have been prepared by the Committee on Material Specifications of the Hydraulic Institute, and cover cast materials generally used in the manufacture of pumping equipment for the petroleum industry.

Oxyacetylene Welding—C. B. Du Bose. *Oil and Gas Journal,* Sept. 21, 1939, pp. 177, 178. A description of a 332-mile line laid by El Paso Natural Gas Co. from western Texas across New Mexico and into Arizona, all but 22 miles of which was oxyacetylene welded. Except for 21 miles of 5-in. pipe, which was single-flame welded, all the joints on this project were welded with four-flame welding tips introduced last year by the Linde Air Products Co. and specially designed for making position or tie-in welds. Actual costs of line-up and welding, all materials, and operating expenses of trucks and equipment, but not overhead, totaled two cents per foot for the entire footage.

Standard Chemical and Technical Dictionary—Compiled by H. Bennett, Fellow of the American Institute of Chemists and the American Association for the Advancement of Science; published by the Chemical Publishing Co., Inc., 148 Lafayette St., New York City; price, $10. The book's 638 pages contain more than 25,000 definitions of words used by technicians, engineers and scientists, covering industrial products, pure chemicals and trade names; abbreviations, contractions, symbols used in mathematics, chemistry, thermodynamics, pharmacy, and other subjects.

Recycling—A New Oil Field Process—C. H. Vivian. *Compressed Air Magazine,* Sept., 1939, pp. 5968-5973. A distillate pool is one in which the pressure is such that the gas and oil exist in one phase—a gaseous phase. To extract the liquid the pressure is released; this is in contrast to the method of manufacture of natural gasoline, where the liquid is extracted by a compression method.

Handbook of Chemistry (Third Edition)—Compiled and edited by N. A. Lange and G. M. Forker; published by Handbook Publishers, Inc., Sandusky, Ohio; price, $6. The first edition of this standard reference book was published in 1934. This 1939 edition gives, in 1543 pages, 168 chemical tables,

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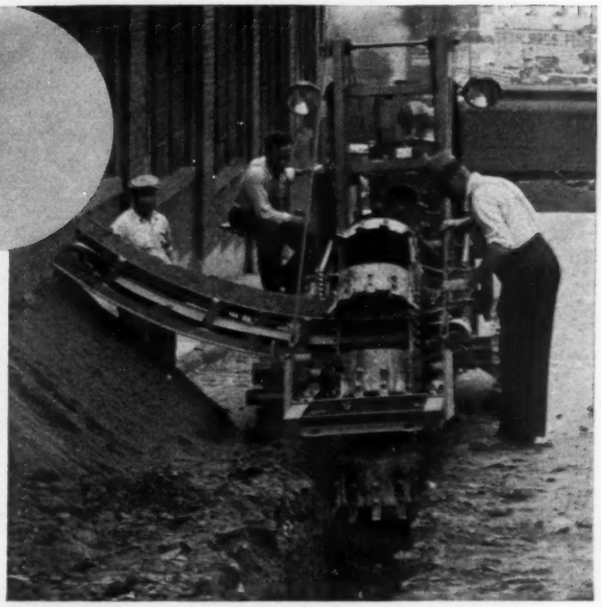

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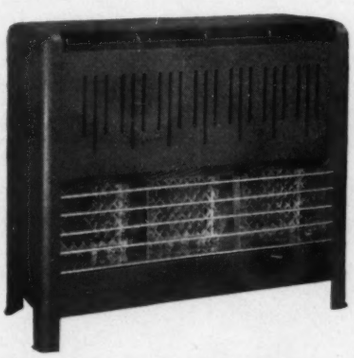

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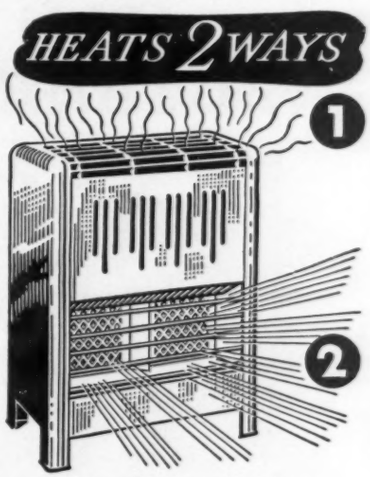
The benefits of Radiant heat and warm air circulated heat are successfully combined in this new Humphrey Radiantfire Circulator.

There is no closed front or other obstruction to reduce the radiant heat output. Cleverly designed heat-exchangers in the Radiantfire Circulator add the room-warming benefits of circulated warm air.

Homes, offices, shops, stores, restaurants, and numberless other places can be heated economically with the Humphrey Radiantfire Circulator. Send for Bulletin RC-39-2 for full color illustrations and complete sales information.



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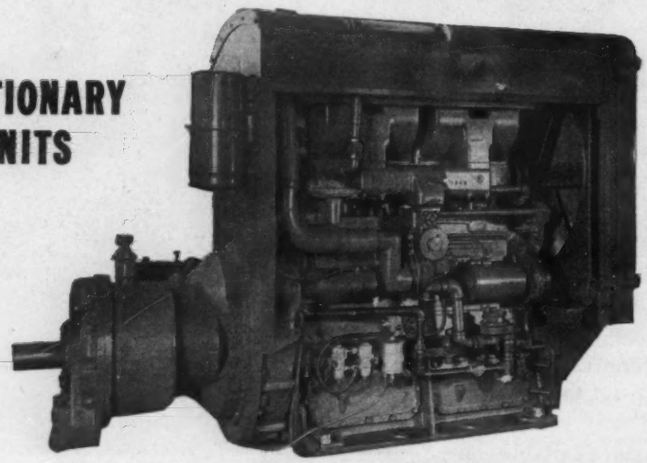

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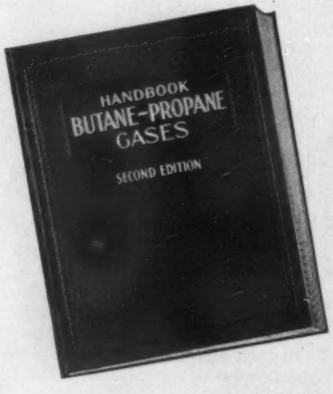

415 Pages

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SECOND EDITION (Revised November, 1938)

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Published by Western Business Papers, Inc., publishers of

GAS
The NATIONAL Gas Magazine

OIL & GAS Equipment Review, 810 S. SPRING ST. Los Angeles, Calif.

of which six are entirely new and 11 completely revised. A mathematical appendix edited by R. S. Burington outlines briefly the formulas and theorems of eight branches of elementary mathematics, through integral calculus and vector analysis, and gives 30 of the more commonly used mathematical tables. With the exception of several explanatory articles, the book is completely tabular.

Property Records Systems—American Gas Association. During the last year 12 members of the Property Records committee of the Association, working independently, have prepared 12 detailed outlines of plans for establishing and maintaining property records. The outline for use in preparing all of the papers included: "Units of Property," "Establishment of Inventory of Existing Property," "Pricing," "Establishment of Continuing Property Record," "Perpetuation of Continuing Property Record," and "General Comments."

Ten-Year Trial Shows Success of Inert Gas System—M. G. Van Voorhis. *National Petroleum News*, Oct. 18, 1939, pp. R441, 443, 444, 447. Displacement of combustible gases in storage tanks and refinery vessels with inert flue gas as a means of fire prevention and maintenance of safety to workmen when tanks are emptied or repairs are to be made has proved to be a practical procedure at Sun Oil Co. refineries and in all Sun tank ships. An enviable fire loss record has been experienced during the 10 years that flue gas has been employed for this service. A number of small generating plants are distributed about large refineries in close proximity to the refining units which they serve. Flue gas generators for tank ships are equipped with considerably more safeguards than a refinery unit.

A Hydrogen Sulphide Recorder—Wilton E. Stackhouse. *Instruments*, Oct., 1939, pp. 280-282. A hydrogen sulphide recorder is described which is capable of determining traces of this constituent when present in city gas or air. A colorimetric reagent is used and registration of color intensities is accomplished by means of photocells and a potentiometer recorder. The total service time required by the recorder averages about three man-hours per week.

New Developments in Burners and Their Application—E. L. Dennis. *Refiner*, Oct. 1939, pp. 87-96. A comprehensive discussion of theory underlying the use of burners, illustrated by diagrammatic sketch, with a description of the latest developments in this field, all of which is preceded by a discussion of the theories of combustion of hydrocarbons together with the mechanism of heat transmission.

Fluid Flow Measurement by Head Type Metering Elements — Stewart and Doolittle. Published by *Instruments*, 1117 Wolfendale St., Pittsburgh, Pa. (price, 50 cents).

Accident Facts, 1939 Edition—Published by the National Safety Council, Inc., 20 N. Wacker Drive, Chicago (50 cents; quantity prices, 10 or more). First half of the 1939 edition tells in words, charts, and pictorial diagrams the most important accident data for 1938, divided into eight classifications: all accidents, occupational, motor vehicle, other public, railroad, aviation, school, and home. The second half of the book gives the supporting, and more detailed, tabular facts for each of the same classifications.

A.G.A. To Issue 1940 Refrigeration Sales Program This Month

EARLY in December details of the "Life Begins in '40 for Gas Refrigeration" program will be presented to the gas industry by the A.G.A. 1940 Refrigeration Committee, it was announced recently by Bernard T. Franck, chairman, and vice president in charge of sales and service for the Milwaukee (Wis.) Gas Light Co.

The 1940 program will inaugurate a 12 months' selling campaign, beginning Jan. 1, 1940, rather than one that begins the second quarter of the year as before.

"While as a whole the industry spends its greatest efforts on refrigeration in the second quarter of each year," Mr. Franck stated, "sound thinking in recent years predicts increased returns through promotion of a more continuous and sustained sales activity. . . . Mechanical refrigerators are wearing out every month in the year. Hence there is every reason to capture new territory in the replacement market throughout the 12 months."

Finishing its 1939 Fall and Winter refrigerator selling campaign, Servel, Inc., is sponsoring a "Christmas Selling Drive," it has been announced by George S. Jones, Jr., vice president and general sales manager for the company. Gas refrigerator salesmen throughout the country are competing for the hundreds of cash and merchandise awards being offered to winning salesmen.

■ ■

Chelsea Cooperative Co. To Lease Gas Service Co. Facilities

The Gas Service Co., Kansas City, November 14, was authorized by the Oklahoma Corporation Commission to turn over for use of the Consumers' Cooperative Gas Co., of Chelsea, such part of its local distribution system as might be required by the cooperative to give gas service to its members.

Action of the Commission was temporary, conditioned on the outcome of an application of the Gas Service Co., to be released entirely from its obligation to serve Chelsea.

On November 2 the Gas Service Co. discontinued its gas distribution in Chelsea on the ground that the supply was insufficient for it to give complete service, including house heating, without undue hazard. The cooperative company, which previously had constructed a distribution system to serve the business district and one residential block of the town, then signed a contract with the Gas Service Co. to lease the latter's distribution lines with option to purchase at the end of five years.

■ ■

California Range Manufacturers Promote Sales on Radio Programs

In an effort to prolong the benefits from the Fall range advertising and sales campaign of the range division of the Pacific Coast Gas Association's manufacturers' section, radio time will be used in both the north and south sections of the State in several presentations weekly, extending up to December 20.

In Southern California a budget of $6000 will be expended by the Natural Gas Bureau under the supervision of J. S. Spaulding, Southern California Gas Co., while the program of northern California will be directed by a range manufacturers' committee headed by E. J. Hinchey, James Graham Manufacturing Co.

■ ■

Color Chart For Classification of Pipe Line Danger Zones Issued

A chart showing the colors used in standard classification of piping systems to identify fire protective systems and piping carrying dangerous or valuable materials has been prepared by the Jones & Laughlin Steel Corp., Pittsburgh, Pa.

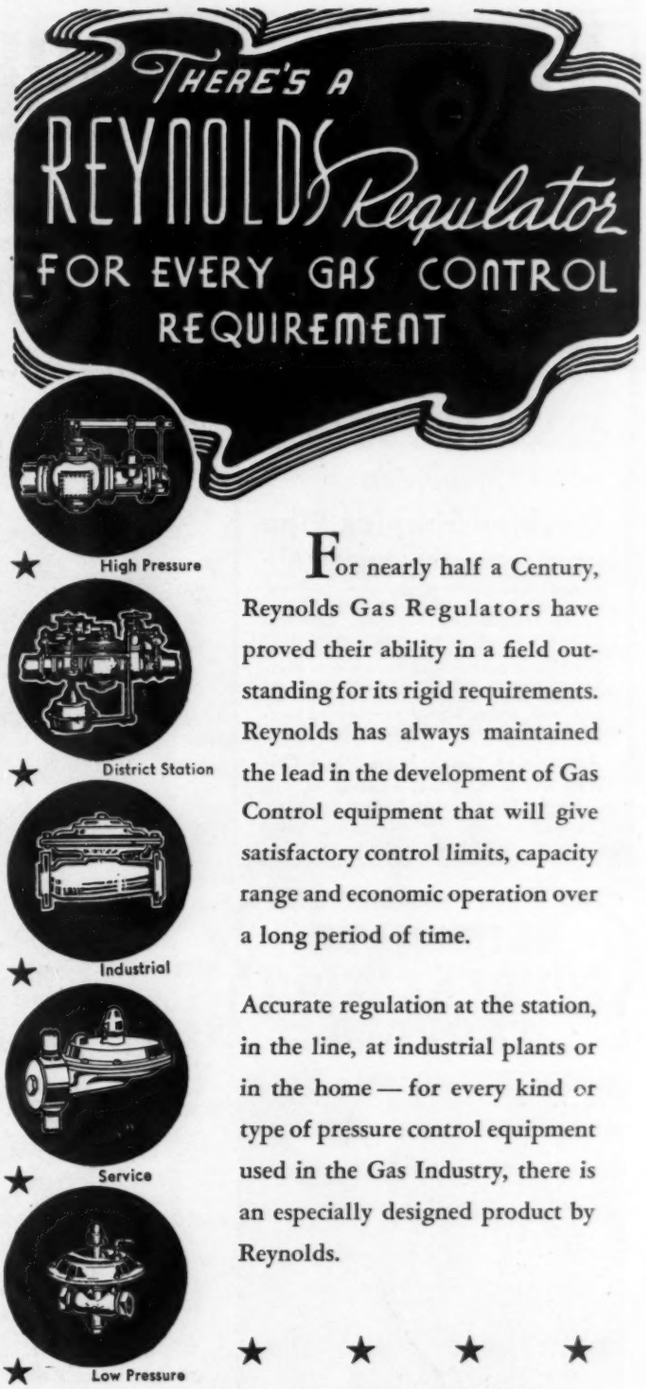
The chart is for distribution to foremen, maintenance engineers, safety engineers, and others responsible for the protection of property and workmen in industrial plants and buildings. It is based on the "Recommended American Practice Scheme for the Identification of Piping Systems," as approved by the American Standards Association. Copies may be obtained free through J & L standard pipe distributors and jobbers.

■ ■

FPC Prescribes Report Form For Natural Gas Companies

The Federal Power Commission has adopted and prescribed for use of natural gas companies a form of financial and statistical report, designated as F.P.C. Form No. 133, and defined in the Natural Gas Act.

It is ordered that each natural gas company shall file with the Commission three executed copies of such financial and statistical report for the year 1939, to be filed on or before February 29, 1940.



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—the permanent chimney lining that totally eliminates chimney deterioration caused by acid-bearing moisture deposited by all types of fuel. Made of Armco Ingot Iron, vitreous enameled both inside and out.

Also manufacturers of Condensation Eliminator and Howle Heat Extractor. Write for free condensation folder and price list.

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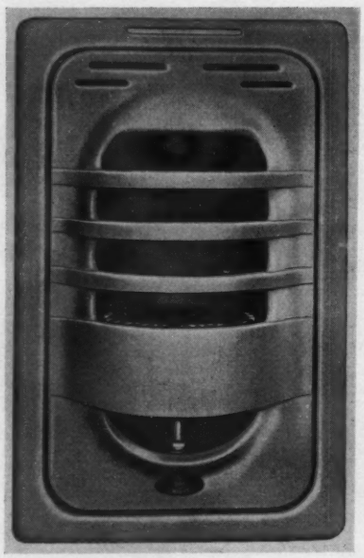
MODERN *Products*

Wall Heater

Day and Night Water Heater Co., Monrovia, Calif.

Model: Lectro-Glo wall heater, Nos. W8 and W13.

Description: This wall heater provides radiant, reflected and circulating heat, and comes in two models, the W8 with single burner and the W13 with twin burners.



The single burner model is 10¾-in. wide and 19⅛-in. high; the twin burner model, 14⅛-in. wide and 19⅛-in. high. The heaters may be secured in any desired color, as well as the standard ivory, walnut, and white. For sections where natural gas is not available, special burners are supplied for manufactured or liquefied petroleum gases.

■ ■

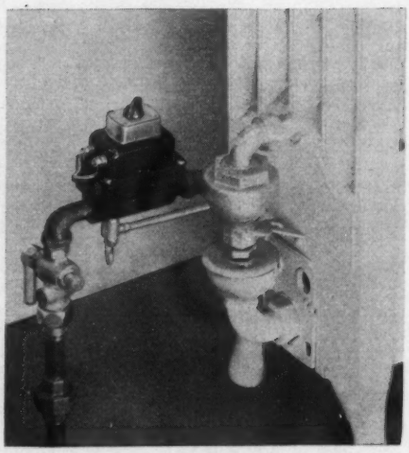
Automatic Gas Control

General Controls Co., Glendale, Calif.

Model: Series B-60-6.

Description: This control consists essentially of a gas actuated gas valve, a pilot burner generator and a thermostat, which is either built integral with the gas valve or of the remote type. In both cases night cut-off is available. It can be used for wall heaters and radiants, water heaters, space heaters, floor furnaces, gas fired steam radiators, circulators, and range heaters. In the case of the water heaters, automatic control is obtained by the use of a tank thermostat. The various units comprising Series B-60-6 can be furnished in a package set or individually.

In water heater installations the compact tank thermostat mounts in the side of the tank, providing accessible adjustment. The wiring is brought up through the water heater casing, making a neat installation.



Designed for natural, manufactured and butane gas service, these new gas package sets bring automatic temperature control to a vast new market.

Catalog: A new illustrated bulletin is available by writing General Controls Co., Glendale, Calif., for Bulletin No. S-230.

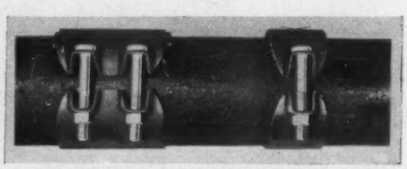
■ ■

Pressed Steel Repair Clamp

M. B. Skinner Co., South Bend, Ind.

Model: Pressed Steel Economy Clamp.

Description: This repair clamp is furnished in two types—regular and perforated. The regular comes 3½-in. in width, with rubber cone plug riveted in, and 6½-in. in width with strip gasket. The



smaller clamp is used for the repair of pit holes, and the larger for running corrosion spots. The perforated type clamp is made so that after the sides are welded, lugs may be broken off to simplify completing the weld.

■ ■

Arc-Welding Electrodes

The McKay Co., York, Pa.

Description: Iron and steel arc-welding electrodes are described in a 24-page catalog recently issued. The tentative specifications approved by both the American Welding Society and the American Society for Testing Materials are given, along with other material, in the booklet. Advice as to proper discrimination among different mild-steel electrodes, according to nature and conditions of the work, is presented in charts. The new catalog, E-16, may be obtained by writing the general sales offices of the company.

STOP *Tearing Up Lawns and Pavements!*

This Greenlee Pusher has capacity for pipe up to 4-inch and is provided with six operating speeds. A somewhat similar pusher for larger pipe, drainage ducts, etc., is also available.

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This tool is compact, easy to handle and simple to operate. Pumping the handles sets up hydraulic pressure within the cylinders, causing the body of the pusher to travel on the notched steel base and to push the pipe through the ground. The pipe clamp is reset only when the pusher reaches the end of the base.

Because it reduces trenching to a minimum and because of its arrangement for speed, this pusher is able to save much time and labor. This has been proved many times under many different conditions. Let us tell you all about it.

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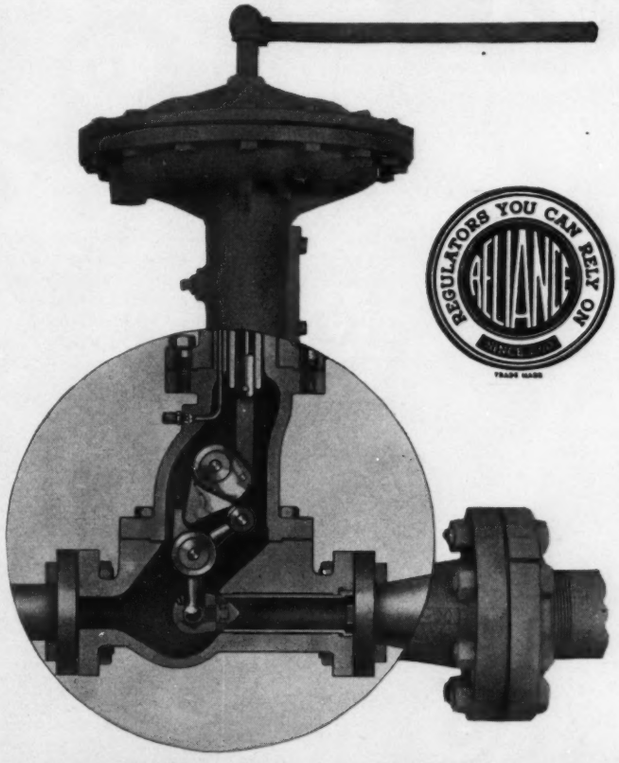

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RELIANCE REGULATORS

Cities Service Gas Co. Builds Natural Gas Line

The Cities Service Gas Co., Bartlesville, Okla., has nearly completed construction of an 8-in. pipe line from the Cunningham field to Hutchinson, Kan. The line, which crosses under the Arkansas river southeast of Hutchinson, will terminate at the Cities Service compressor station. The Ninnescah river, southeast of Arlington and Silver Creek, southwest of that town, will also be crossed under in completing the project.

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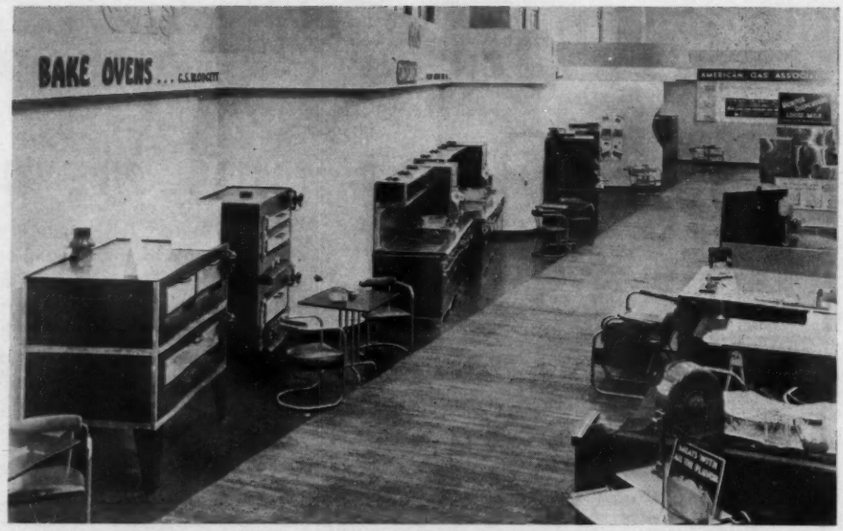

General view of the Gas Industry exhibit at the 24th Annual Hotel Show held in Grand Central Palace, New York City, on November 13, 1939.

Gas Exhibit Is Feature Of Annual Hotel Show

GAS was well represented at the 24th Annual Hotel Show held in the Grand Central Palace, New York City, during the week of November 13th. Under the leadership of Eugene D. Milener, secretary of the Industrial Gas Section of the American Gas Association, the A.G.A., Consolidated Edison Co. of New York, and a number of manufacturers of hotel and restaurant heavy duty equipment cooperated in building and maintaining one of the most outstanding displays of the show.

The entire North Wall of the Grand Central Palace was occupied by the gas appliance booths, which were separated by shallow wings, but unified through a continuous color scheme.

The hotel show is held annually to coincide with a number of hotel management and departmental conventions, and the Gas exhibit has been a regular feature of the show for the past 10 years.

Morro Bay, Calif., Receives Natural Gas Service

With the completion of a 12-mile pipe line from San Luis Obispo to Morro Bay, Calif., natural gas has replaced the butane gas formerly served at Morro Bay. The commencement of natural gas service was observed in Morro Bay by a ceremony in which T. C. Hopkins, president of the local Chamber of Commerce, opened the valve which let natural gas into the mains, and by a banquet given by officials of the Santa Maria Gas Co., through whose facilities the pipe line was constructed.

The cost of the line was $55,000, according to a statement by R. E. Easton, president of the Santa Maria company, who also officiated at the opening ceremonies. Installation of the 4-in. line was made by the C. C. Hartley Construction Co. of Avenal.

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Orifice Well Tester Described at S.C.M.A.

A paper on the "Measurement of Gas by Orifice Well Tester and Pitot Tube" was presented by W. L. Cowan, Gas Department, Union Oil Co., at the monthly meeting of the Southern California Meter Association held November 28 at Huntington Park, Calif. The paper, illustrated by slides, was followed by a motion picture, "Story of the Coast Guard," presented by Commander L. L. Bennett of the Coast Guard. Entertainment was furnished through the courtesy of the American Meter Co.

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Commercial Gas Heat Is Subject of Discussion

The Metropolitan Heating and Air Conditioning Council, Newark, N. J., met on October 17 to listen to a program on "Gas Heat in Commercial Establishments," but so extensive was the discussion that it was continued for a full day on November 8.

The meeting was presided over by Chairman R. A. Maloney.

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Safford, Ariz., Contracts For Municipal System

The city of Safford, Ariz., has recently granted the Crane Co., Chicago, a contract for the construction of a municipal distribution system. The system will cost approximately $55,000, and will be financed by the issuance of bonds as soon as all details are approved by the RFC.

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BALTIMORE, Boston, Charleston, Louisville, Philadelphia—all have cast iron gas mains in service that were laid 100 years, or more, ago. What changes those sturdy old mains have taken in their stride! Stage-coach to trolley, motorbus and ten-ton trucks. Yet cast iron pipe, as made today, is an even better product, and, with the modern stuffing-box type mechanical joint, is *bottle-tight* under modern working pressures.

Look for the "Q-Check" registered trade mark. Cast iron pipe is made in diameters from 1¼ to 84 inches.

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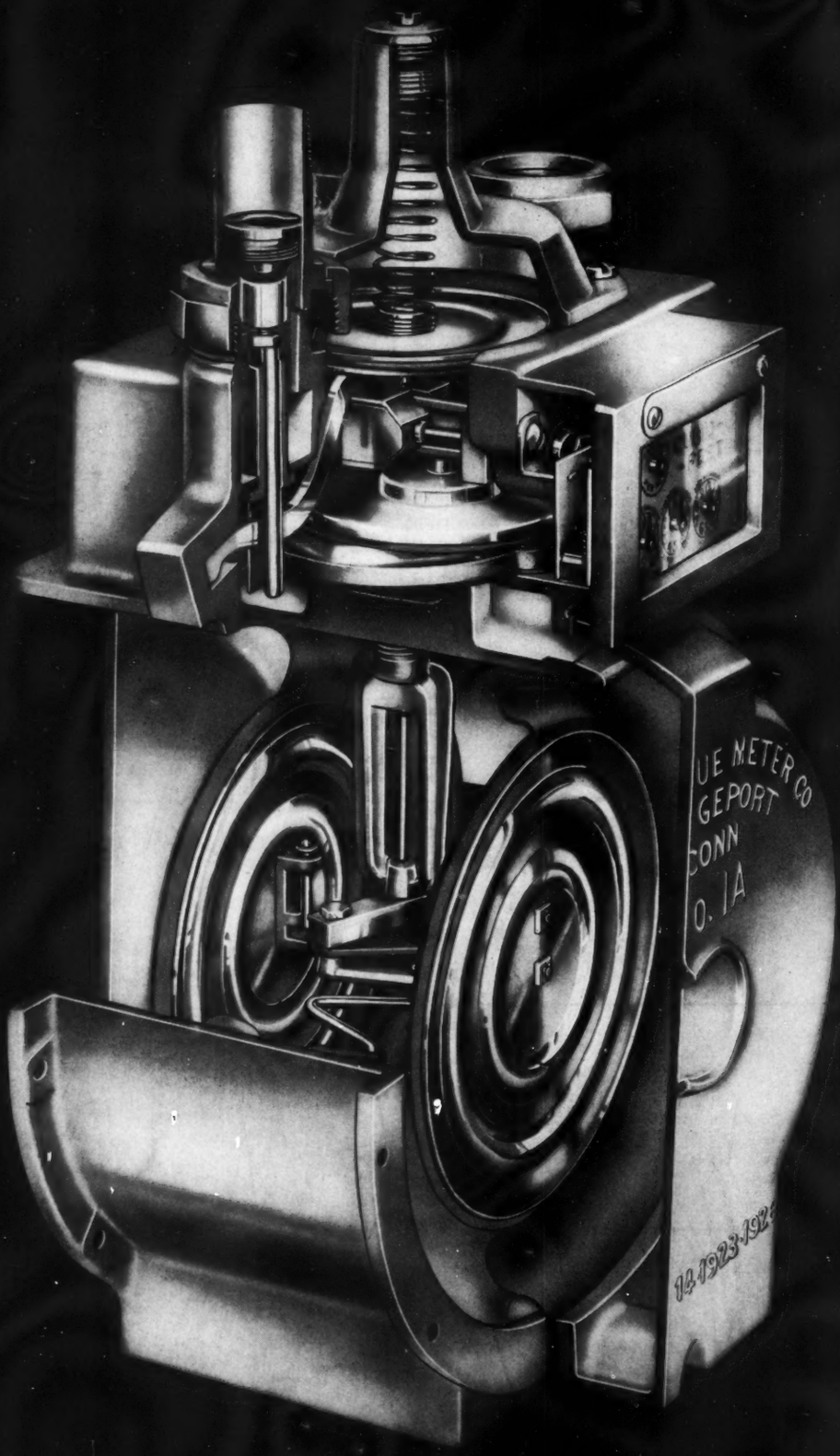
CAST IRON PIPE

THE STANDARD MATERIAL FOR UNDERGROUND MAINS

Stuffing-box type mechanical joints, as made by CIPRA members, differ in design but not in principle. All are bottle-tight.

This cast iron distribution main in Charleston, S. C. begins a second century of service. When uncovered for inspection it looked "good enough to last forever."

Sprague Leads Again



Here it is!!

The latest achievement in Gas Measurement and Control . . . a combination Meter and Regulator. Write for particulars.

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